

TH 6255
.N3
1886

Illustrated Catalogue

AND Price List.

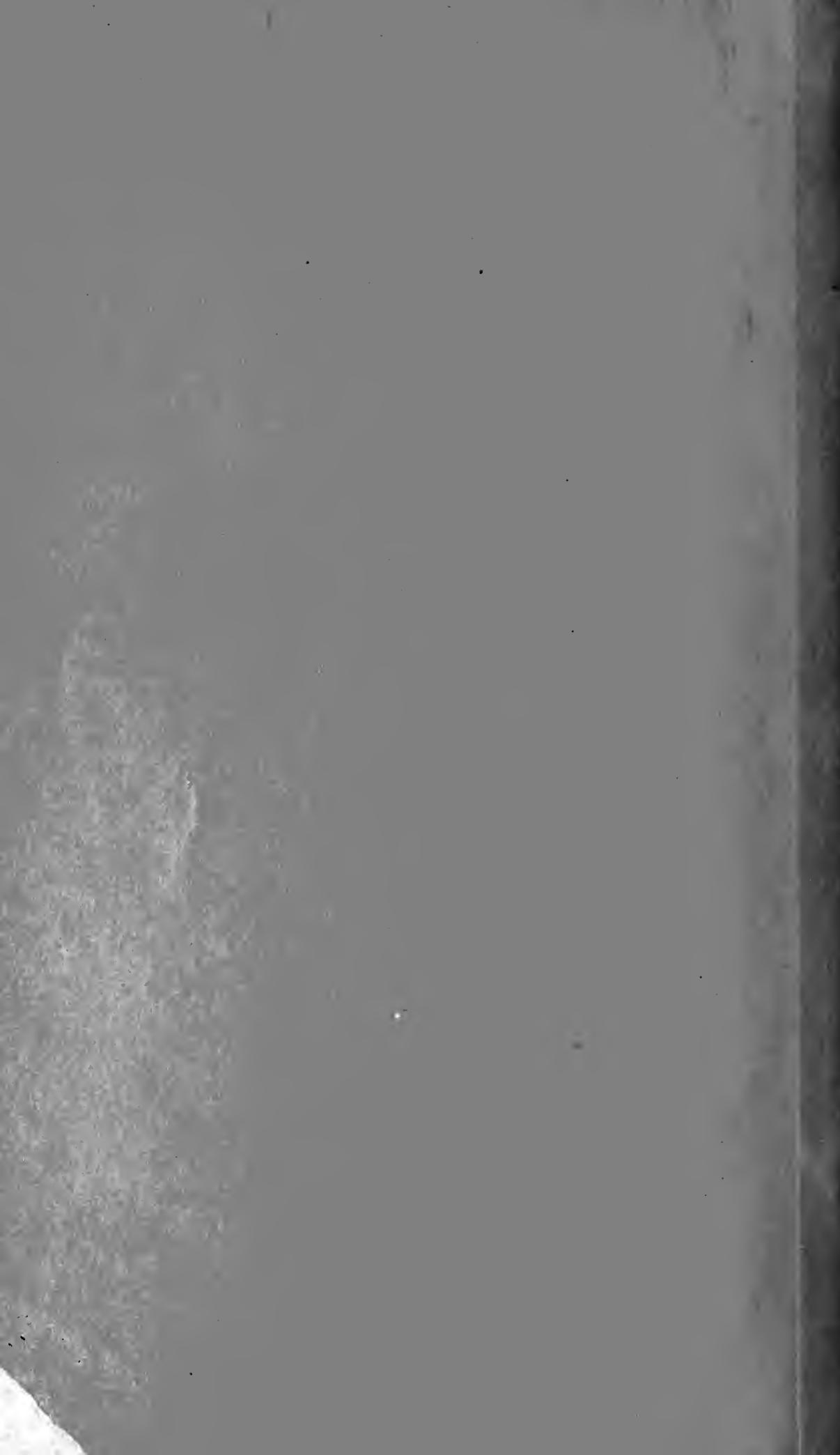
 M. A. G.

Wilson Manufacturing Co.

No. 71 Beekman Street.

New York.

April, 1886.





✓
NASON MANUFACTURING CO.,
"

71 BEEKMAN STREET, NEW YORK.

ILLUSTRATED LISTS OF PRICES

FOR

WROUGHT AND CAST IRON PIPE, ETC..

Brass and Iron Valves and Fittings,

AND

GENERAL SUPPLIES FOR STEAM, GAS, WATER, AMMONIA
AND OIL.

*15
9/27a*
Steam and Gas Fitters', and Plumbers' Tools and
Supplies.

STEAM HEATING SPECIALTIES.

APRIL, 1886.



TH 6255
T23
1886

PRESS E. P. COBY & CO.,
NEW YORK.

For general information concerning Metals, Steam Heating, Water, Steam and Gases; also, valuable tables for ready reference, see pages 154 to 171.



This issue supersedes all previous Lists of Prices.

PLEASE NOTE THE FOLLOWING:

WALL prices are subject to Market Changes. We will endeavor, however, so far as practicable, to notify customers of important changes.

All claims for corrections or deductions must be made within Ten days after receipt of goods.

Terms—Net Cash in Thirty Days, unless otherwise agreed upon.

Our responsibility ceases as soon as goods are delivered in good order and condition at Railroad Depot or Wharf in this City, and receipt taken for the same.

Boxing, when required, charged at cost.

Cartage, also, charged at cost.

No goods insured, unless so ordered.

Orders promptly and carefully filled.

All correspondence should be addressed to the Company.

NASON MANUFACTURING CO.,

Manufacturers,

ESTABLISHED BY JOSEPH NASON IN 1841.

INCORPORATED IN 1884.

CARLETON W. NASON, PRESIDENT.

FRANKLIN DARRACOTT, VICE-PRESIDENT.

SAMUEL GREASON, TREASURER.

TELEGRAPHIC CODE.

For convenience of our customers, we have adopted the following CIPHER for ordering PLAIN AND GALVANIZED WROUGHT IRON PIPE BY TELEGRAPH:

NUMBER OF FEET.	SIZE.	PLAIN.	SIZE.	GALVANIZED.
25	Africa,			
50	Armenia,	$\frac{1}{8}$	Allegheny,	$\frac{1}{4}$
75	Arabia,	$\frac{1}{4}$	Baltimore,	$\frac{3}{8}$
100	Asia,	$\frac{3}{8}$	Camden,	$\frac{1}{2}$
200	Belgium,	$\frac{1}{2}$	Detroit,	$\frac{3}{4}$
300	Chili,	$\frac{3}{4}$	Erie,	1
400	Denmark,	1	Fairmount,	$1\frac{1}{4}$
500	Egypt,	$1\frac{1}{4}$	Galena,	$1\frac{1}{2}$
600	France,	$1\frac{1}{2}$	Harrisburgh,	2
700	Germany,	2	Ithaca,	$2\frac{1}{2}$
800	Holland,	$2\frac{1}{2}$	Jamestown,	3
900	Ireland,	3	Kensington,	$3\frac{1}{2}$
1,000	Japan,	$3\frac{1}{2}$	Lancaster,	4
2,000	Kentucky,	4	Macon,	$4\frac{1}{2}$
3,000	Liberia,	$4\frac{1}{2}$	Quincy,	5
4,000	Maine,	5	Newark,	6
5,000	Nevada,	6	Oneida,	7
6,000	Ohio,	7	Paris,	8
7,000	Peru,	8	Reading,	9
8,000	Russia,	9	Salem,	10
9,000	Spain,	10	Troy.	.....
10,000	Texas,	.....	.....	.....
20,000	Utah.	.....	.....	.....

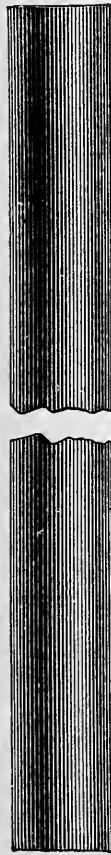
Mabel.....	Ship via Rail.
Louise.....	Ship via Canal.
Mattie.....	Ship via Steamer.
Julia.....	Ship via Express.
Acorn.....	At what price can you furnish?
Branch.....	At what price and how soon can you furnish?
Gate.....	When can you ship?

EXAMPLES: Ship via Rail, 500 feet 2" Plain Pipe; for this, telegraph MABEL EGYPT ITHACA.

Or, At what price can you furnish 100 feet $1\frac{1}{4}$ " Galvanized Pipe? for this, telegraph ACORN ASIA FIRTH.

By this plan, mistakes by operators are prevented, and economy of words assured.

LAP-WELDED AMERICAN CHARCOAL IRON BOILER TUBES.



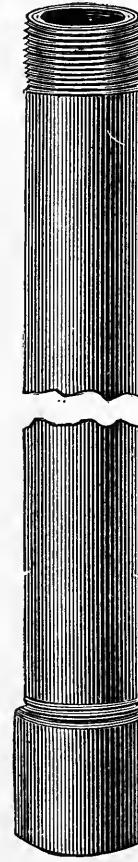
OF STANDARD GAUGE, NOT OVER 18 FEET LONG.

Outside diameter	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3	3 $\frac{1}{4}$	3 $\frac{1}{2}$	4	5	6
Price per foot . . . . .	.23	.23	.22	.22	.25	.28	.31	.34	.38	.43	.52	.72	1.00
Thickness, inches . . . . .	.072	.083	.095	.095	.095	.109	.109	.109	.12	.12	.134	.148	.165
Nearest wire gauge.	15	14	13	13	13	12	12	12	11	11	10	9	8
Nominal weight per ft . . . . .	.9	1.24	1.66	1.90	2.16	2.75	3.	3.33	3.96	4.28	5.47	7.58	10.16

The above prices are for tubes up to 20 feet long—for tubes in excess of that length, ten per cent. will be added to net of invoice.

Extra thickness of tubes will be charged as per list of extra gauges.

WROUGHT IRON WELDED PIPE.



LIST OF PRICES AS REVISED JUNE 11, 1884.

Internal Diameter	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	7	8	9	10
Plain, per foot . . . . .	.03 $\frac{3}{4}$	.03 $\frac{1}{4}$	.03 $\frac{3}{4}$	.04 $\frac{3}{4}$	.06	.08	.11	.21	.26	.42	.55	.67	.83	1.20	1.50	2.00	2.75	3.70	4.75
Galvanized, per foot . . . . .	.05 $\frac{1}{2}$	.05	.05	.05 $\frac{1}{2}$	.06	.08	.10 $\frac{1}{2}$	.14	.24	.30	.47	.62	.83	1.00	1.50	2.00	2.75	3.70	4.75
Tarred, per foot . . . . .	.04 $\frac{1}{2}$	.04	.04 $\frac{1}{2}$	.05 $\frac{1}{2}$	.05 $\frac{1}{2}$	.07 $\frac{1}{2}$	.09 $\frac{1}{2}$	.13	.26	.32	.50	.65	.81	1.00	1.00	1.00	1.00	1.00	1.00

Wrought Iron Pipe Cut and Fitted from Plans or Specifications furnished.

WROUGHT IRON WELDED PIPE

FOR STEAM, GAS, WATER, OR OIL.

1 inch and below, butt-welded; proved to 300 pounds per square inch, hydraulic pressure.
 1 $\frac{1}{4}$ inch and above, lap-welded; proved to 500 pounds per square inch, hydraulic pressure.

TABLE OF STANDARD SIZES.

Inside Diameter Nominal.	Actual Outside Diameter.	Thickness.	External Circumference.	Length of Pipe, per Square Foot of Outside Surface.	Actual Internal Area.	External Area.	Length of Pipe containing one Cubic Foot.	Weight per Foot of Length.	No. of Threads per inch of Screw.
$\frac{1}{8}$	.405 in.	.068 in.	1.272 in.	9.44 ft.	.0572 in.	.129 in.	2500 ft.	.243 lbs.	27
$\frac{1}{4}$	.54 "	.088 "	1.696 "	7.075 "	.1041 "	.229 "	1385 "	.422 "	18
$\frac{3}{8}$	.675 "	.091 "	2.121 "	5.657 "	.1916 "	.358 "	751.5 "	.561 "	18
$\frac{1}{2}$	.84 "	.109 "	2.652 "	4.502 "	.3048 "	.554 "	472.4 "	.845 "	14
$\frac{3}{4}$	1.05 "	.113 "	3.299 "	3.637 "	.5333 "	.866 "	270.	1.126 "	14
1	1.315 "	.134 "	4.134 "	2.903 "	.8627 "	1.357 "	166.9 "	1.670 "	11 $\frac{1}{2}$
$1\frac{1}{4}$	1.66 "	.140 "	5.215 "	2.301 "	1.496 "	2.164 "	96.25 "	2.258 "	11 $\frac{1}{2}$
$1\frac{1}{2}$	1.9 "	.145 "	5.969 "	2.01 "	2.038 "	2.835 "	70.65 "	2.694 "	11 $\frac{1}{2}$
2	2.375 "	.154 "	7.461 "	1.611 "	3.355 "	4.430 "	42.36 "	3.667 "	11 $\frac{1}{2}$
$2\frac{1}{2}$	2.875 "	.204 "	9.032 "	1.328 "	4.783 "	6.491 "	30.11 "	5.773 "	8
3	3.5 "	.217 "	10.996 "	1.091 "	7.388 "	9.621 "	19.49 "	7.547 "	8
$3\frac{1}{2}$	4.	.226 "	12.566 "	.955 "	9.837 "	12.566 "	14.56 "	9.055 "	8
4	4.5 "	.237 "	14.137 "	.849 "	12.730 "	15.904 "	11.31 "	10.728 "	8
$4\frac{1}{2}$	5.	.247 "	15.708 "	.765 "	15.939 "	19.635 "	9.03 "	12.492 "	8
5	5.563 "	.259 "	17.475 "	.629 "	19.990 "	24.299 "	7.20 "	14.564 "	8
6	6.625 "	.280 "	20.813 "	.577 "	28.889 "	34.471 "	4.98 "	18.767 "	8
7	7.625 "	.301 "	23.954 "	.505 "	38.737 "	45.663 "	3.72 "	23.410 "	8
8	8.625 "	.322 "	27.096 "	.444 "	50.039 "	58.426 "	2.88 "	28.348 "	8
9	9.688 "	.344 "	30.433 "	.394 "	63.633 "	73.715 "	2.26 "	34.677 "	8
10	10.75 "	.366 "	33.772 "	.355 "	78.838 "	90.762 "	1.80 "	40.641 "	8

EXTRA STRONG AND DOUBLE EXTRA STRONG WROUGHT IRON WELDED PIPE.

Nominal Diameter.	Actual Outside Diam.	Thickness, Extra Strong.	Thickness, Double Extra Strong.	Actual Inside Diam. Extra Strong.	Actual Inside Diam. Double Extra Strong.	Price, per Foot, Extra Strong.	Price, per Foot, Double Extra Strong.
Inches.	Inches.	Inches,	Inches.	Inches.	Inches.		
$\frac{1}{8}$	0.405	0.100	.....	0.205	.....	.06 $\frac{1}{2}$	.13
$\frac{1}{4}$	0.54	0.123	.....	0.294	.....	.06 $\frac{1}{2}$	.13
$\frac{3}{8}$	0.675	0.127	.....	0.421	.....	.07 $\frac{1}{2}$	.15
$\frac{1}{2}$	0.84	0.149	0.298	0.542	0.244	.09 $\frac{1}{2}$	.19
$\frac{3}{4}$	1.05	0.157	0.314	0.736	0.422	.12	.24
1	1.315	0.182	0.364	0.951	0.587	.16	.32
$1\frac{1}{4}$	1.66	0.194	0.388	1.272	0.884	.22	.44
$1\frac{1}{2}$	1.9	0.203	0.406	1.494	1.088	.42	.84
2	2.375	0.221	0.442	1.933	1.491	.52	1.04
$2\frac{1}{2}$	2.875	0.280	0.560	2.315	1.755	.84	1.68
3	3.5	0.304	0.608	2.892	2.284	1.10	2.20
$3\frac{1}{2}$	4.0	0.321	0.642	3.358	2.716	1.34	2.68
4	4.5	0.341	0.682	3.818	3.136	1.66	3.32

IRON HYDRAULIC PIPE.

NOT OF STANDARD DIMENSIONS. MADE TO ORDER. PRICES NET.

$\frac{1}{4}$ inch thick, or under.....	16 cents per pound.
Over $\frac{1}{4}$ inch to $\frac{3}{8}$ inch, inclusive	18 "
" $\frac{3}{8}$ " to $\frac{1}{2}$ " "	20 "
" $\frac{1}{2}$ " to $\frac{3}{4}$ " "	25 "
" $\frac{3}{4}$ " to 1 " "	30 "

HEAVY DRIVE WELL PIPE.

WITH THE ALLISON PATENT VANISHING THREAD.

Diameter Inside.	Full Lengths.		Half Lengths.		Third Lengths.		Weight, per Foot.
	Black.	Galvanized.	Black.	Galvanized.	Black.	Galvanized.	
$1\frac{1}{4}$ in.	.15	.21	.17	.23	.18	.24	2.70
$1\frac{1}{2}$ "	.18	.25	.20	.27	.22	.29	3.24
2 "	.23	.32	.25	.34	.26	.35	4.26
$2\frac{1}{2}$ "	.34	.49	.37	.52	.40	.55	6.89
3 "	.46	.65	.49	.68	.52	.71	8.74
$3\frac{1}{2}$ "	.62	.84	.66	.88	.71	.93	10.18
4 "	.77	1.03	.83	1.09	.89	1.15	11.89
$4\frac{1}{2}$ "	.92	1.21	1.00	1.29	1.08	1.37	13.36
5 "	1.02	1.35	1.14	1.47	1.26	1.59	15.32
6 "	1.39	1.80	1.54	1.95	1.69	2.10	18.76
7 "	1.85	2.33	2.08	2.56	2.31	2.79	23.27
8 "	2.54	3.15	2.85	3.46	3.15	3.76	28.18

Full lengths range from 16 to 18 feet.

Half " " " 8 to 9 "

Third " " " 5 to 6 "

Each length is fitted with one coupling without extra charge.

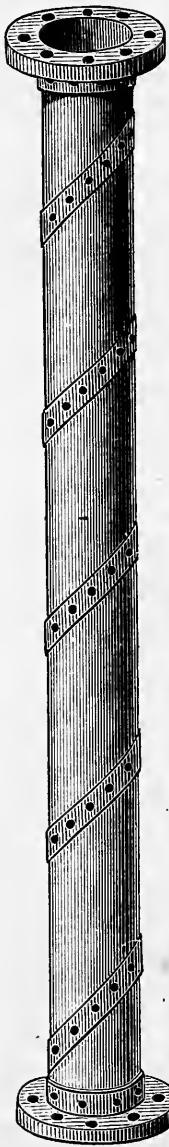
LIGHT GALVANIZED RIVETED HOUSE LEADER AND ELBOWS, VENTILATING,
AIR AND BLOWER PIPE, Etc.



Inside Diameter.....	2 in.	2½ in.	3 in.	3½ in.	4 in.	5 in.	6 in.
Price per Foot .....	.14	.17	.19	.21	.25	.30	.38
Adjustable Elbows, Galvanized .....	.15	.18	.25	.30	.35	.50	.75
Four piece, Stiff, Elbow Galvanized.....	....	....	.25	.32	.35	.40	.65

PIPE MANUFACTURED IN LENGTHS OF TEN FEET, AND LESS.

DOUBLE GALVANIZED SPIRAL RIVETED FLANGED PRESSURE PIPE.

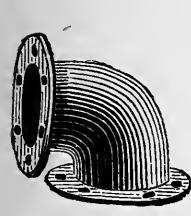


MADE OF GALVANIZED IRON, AND REGALVANIZED AFTER FORMATION, THEREBY MAKING ALL SEAMS AND LAPS PERFECTLY SOLID.

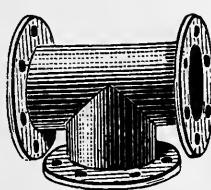
EACH LENGTH TESTED TO 150 POUNDS HYDRAULIC PRESSURE, SUITABLE FOR EXHAUST STEAM, EXHAUST-STEAM HEATING, PUMP SUCTIONS, PUMP COLUMNS, COMPRESSED AIR, REFRIGERATING PIPE, &c.

Inside Diameter.....	3	4	5	6	7	8	9	10	12	14	16	18	20
Price per Foot, including Flanges .....	.50	.70	1.00	1.20	1.40	1.70	2.00	2.60	3.15	4.00	5.15	6.40	7.95
Thickness, Birmingham Gauge, No.	20	20	20	18	18	18	18	16	16	14	14	14	14
Nominal Weight per foot lbs.....	2½	3	4	5	6	7	8	11	14	20	24	29	34

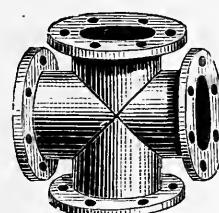
GALVANIZED CAST AND WROUGHT IRON FITTINGS, FOR FLANGED SPIRAL PIPE.



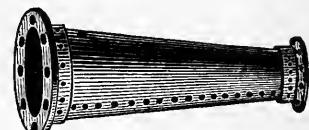
ELBOW.



TEE.



CROSS.



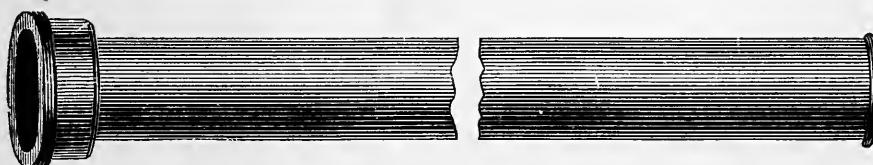
REDUCER.

Inside Diameter.	Elbows.	Tees.	Crosses.	Reducers.	Flanges.	Disks or Blind Flanges.	Bolts and Nuts.	Composition Gaskets.
3 in.	1.60	2.75	4.15	.....	.39	.45	.04	.09
4 "	2.10	3.25	5.30	* 3.00	.52	.65	.04	.10
5 "	2.85	4.40	6.70	* 3.50	.65	.78	.04	.12
6 "	4.10	5.70	8.00	* 4.75	.78	1.17	.04 1/2	.16
7 "	5.10	7.30	11.00	* 5.50	1.04	1.56	.04 1/2	.18
8 "	6.70	9.80	14.25	* 6.50	1.17	1.82	.04 1/2	.23
9 "	9.00	13.80	18.80	* 8.00	1.56	2.34	.04 1/2	.31
10 "	10.00	17.60	24.50	* 10.25	1.82	2.47	.04 1/2	.40
12 "	15.80	22.50	30.00	* 13.00	2.08	3.90	.04 1/2	.50
14 "	* 22.30	* 30.50	* 38.00	* 16.50	2.60	5.46	.05	.63
16 "	* 30.00	* 44.00	* 53.00	* 21.30	4.42	6.76	.05	.90
18 "	* 34.00	* 50.00	* 59.00	* 26.00	5.07	9.10	.05	1.08
20 "	* 38.50	* 56.00	* 67.00	* 29.40	5.59	11.70	.05	1.25

* All Fittings marked thus are riveted sheet iron, all others are cast iron.

FITTINGS OF ANY DESIGN MADE TO ORDER.

The Disks can be Tapped to Suit Wrought Iron Pipe if Required.



CAST IRON DRAIN, WATER, AND SMOKE PIPES.

Size, inches	2	3	4	5	6	7	8	10
Number of feet in length, clear of Hubs.....	5	5	5	5	5	5	5	5
Price for Light, Single Hub, per foot.....	.24	.30	.36	.50	.60	1.00	1.25	2.00
Price for Light, Double Hub, per length.....	1.50	1.80	2.10	2.80	3.30	....	....	....

For Fittings to suit, see Index.

CAST IRON WATER, GAS AND FLANGE PIPE.

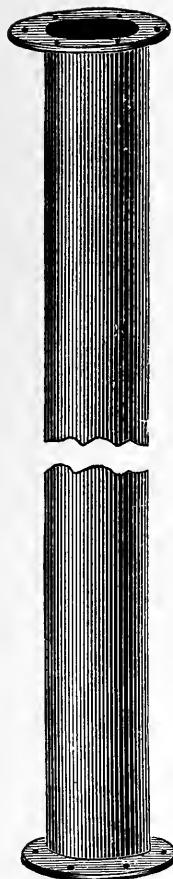
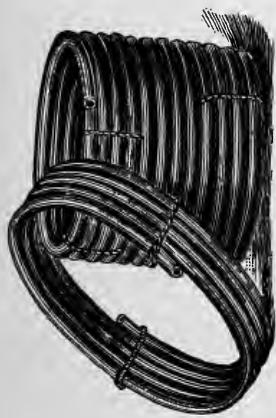


TABLE SHOWING THICKNESS OF METAL AND WEIGHT PER LENGTH FOR DIFFERENT SIZES OF PIPE UNDER VARIOUS HEADS OF WATER.

Size.	50 Ft. Head.		100 Ft. Head.		150 Ft. Head.		200 Ft. Head.		250 Ft. Head.	
	Thickness of Metal.	Weight per Length.	Thickness of Metal.	Weight per Length.	Thickness of Metal.	Weight per Length.	Thickness of Metal.	Weight per Length.	Thickness of Metal.	Weight per Length.
2	.294	63	.312	67 1/2	.330	72	.348	76 1/2	.366	81
3	.344	144	.353	149	.362	153	.371	157	.380	161
4	.361	197	.373	204	.385	211	.397	218	.409	226
5	.378	254	.393	265	.408	275	.423	286	.438	298
6	.393	315	.411	330	.429	345	.447	361	.465	377
8	.422	445	.450	475	.474	502	.498	529	.522	557
10	.459	600	.489	641	.519	682	.549	723	.579	766
12	.491	768	.527	826	.563	885	.599	944	.635	1004
14	.524	952	.566	1031	.608	1111	.650	1191	.692	1272
16	.580	1215	.604	1253	.652	1360	.700	1463	.748	1568
18	.589	1370	.643	1500	.697	1630	.751	1761	.805	1894
20	.622	1603	.682	1763	.742	1924	.802	2086	.862	2248
24	.687	2120	.759	2349	.831	2580	.903	2811	.975	3045
30	.785	3020	.875	3376	.965	3735	1.055	4095	1.145	4458
36	.882	4070	.990	4581	1.098	5096	1.206	5613	1.314	6133
42	.980	5265	1.106	5958	1.232	6657	1.358	7360	1.484	8070
48	1.078	6616	1.222	7521	1.366	8431	1.510	9340	1.654	10269

In lengths of 12 feet, except the 2-inch, which are 9 feet long.
Lowest prices furnished on specifications.

LEAD PIPE.



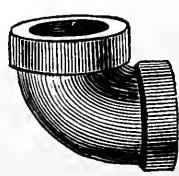
Inside Diameter	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	1 3/4	2
AAA, weight per foot, lbs., oz....	2- 8	3- 0	3- 8	4-12	6- 0	...	...	...	....
AA, " " "	1- 8	2- 0	2-12	3-12	4-12	6- 0	8- 0	8- 8	9- 0
A, " " "	1- 4	1-12	2- 8	3- 0	4- 3	4-12	6- 8	6- 8	7- 0
B, " " "	1- 4	1- 4	2- 0	2- 4	3- 4	3-12	5- 0	5- 0	6- 0
C, " " "	-10	1- 0	1- 8	1-12	2- 8	3- 0	4- 4	4- 0	4-12
D, " " "	- 7	-12	1- 0	1- 4	2- 0	2- 8	3- 8	....	....
E, " " " .....	....	- 9	-12	1- 0	1-10	2- 0	3- 0	....	....

Sheet Lead, weight per square foot, pounds $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, 6, 8, 9, and upward.

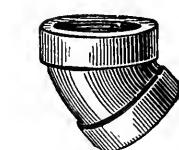
Lead Pipe or Sheet Lead cut to any lengths.

Lead Pipe and Sheet Lead furnished at lowest prices current at time of purchase.

CAST IRON FITTINGS FOR WROUGHT IRON PIPE.



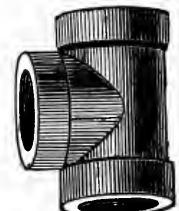
45° ELBOW.



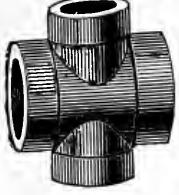
CLOSE RETURN BEND.



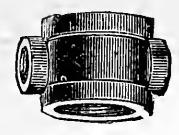
REDUCING ELBOW.



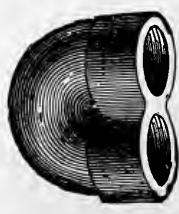
ELBOW SIDE OUTLET.



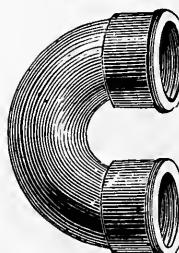
TEE.



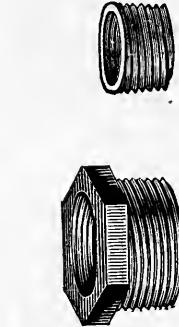
REDUCING CROSS.



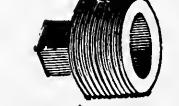
OPEN RETURN BEND.



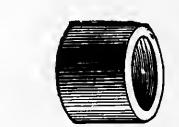
CLOSE RETURN BEND.



FLANGE UNION.



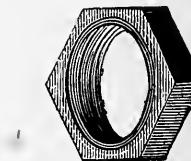
PLUG.



REDUCING COUPLING.



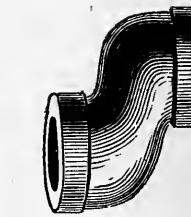
REDUCING CROSS.



LOCKNUT.



Y BRANCH.



OFFSET.

BUSHINGS.

FLANGE UNION.

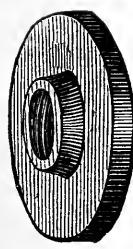
CAP.

CAST IRON FITTINGS.

Size of Pipe.....	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	10	12
ELBOWS.	each,	.04	.05	.06	.09	.13	.20	.25	.40	.75	1.10	1.35	1.80	2.50	2.85	3.90	7.00	10.00	20.00
" Right and Left	each,	.05	.06	.07	.11	.16	.23	.29	.46	.85	1.25	1.50	2.10	3.00	3.25	4.50	8.00	11.50	23.00
" With Side Outlets,	each,	.08	.10	.12	.18	.26	.40	.50	.80	1.50	2.20	2.70	3.60	5.00	5.70	7.80	14.00	20.00	40.00
" With Back Outlets, to order	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
45° ELBOWS.	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
TEES.....	each,	.06	.07	.09	.13	.20	.30	.38	.60	1.10	1.50	2.00	2.50	3.50	4.00	5.50	10.00	15.00	25.00
CROSSES.....	each,	.08	.10	.12	.18	.28	.40	.50	.80	1.50	2.20	2.70	3.50	5.00	5.70	7.80	14.00	20.00	40.00
RETURN BENDS, Close.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" Open.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
FLANGED UNIONS.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
BUSHINGS.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
PLUGS.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
CAPS.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
REDUCING COUPLINGS.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
LOCKNUTS.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
BRANCHES.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
OFFSETS, to set off 4 in.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" 6.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" 8.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
ELBOWS, Reducing.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
TEES.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
CROSSES.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
ELBOWS, Galvanized.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
TEES.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
CROSSES.....	each,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Right and Left, and Left Hand Fittings will be charged 15 per cent. more than Right Hand Fittings.

Galvanized Reducing Fittings will be charged at double the price of Plain Reducing Fittings.



FLANGE.

CAST IRON FLANGES.



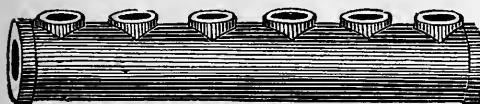
BLANK FLANGE.

SIZE OF PIPE.	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	7	8	9	10	12
3 1/2	14	17	.18	.20	.23													
4	17	20	.21	.22	.25													
4 1/2	20	26	.28	.30	.31													
5	26	31	.33	.33	.35	.36	.38											
5 1/2	31	40	.40	.42	.42	.42	.45	.45										
6	40	50	.50	.52	.52	.52	.55	.55	.55									
6 1/2	50	55	.60	.62	.62	.62	.65	.65	.65	.70								
7	55	65	.68	.72	.72	.72	.75	.75	.75	.75								
7 1/2	65	75	.80	.80	.80	.80	.80	.80	.80	.84	.87							
8	75	85	.90	.90	.90	.90	.90	.90	.90	.90	.96	1.00	1.04					
8 1/2	85	95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.08	1.13	1.22					
9	95	105	1.10	1.10	1.10	1.10	1.15	1.15	1.15	1.22	1.26	1.40	1.65					
9 1/2	105	115	1.20	1.20	1.20	1.20	1.25	1.25	1.30	1.37	1.55	1.58	1.80	2.20				
10	115	125	1.30	1.30	1.30	1.30	1.40	1.40	1.45	1.52	1.75	1.76	2.00	2.40				
10 1/2	125	135	1.40	1.40	1.40	1.40	1.65	1.65	1.65	1.75	1.95	1.95	2.20	2.60				
11	135	145	1.50	1.50	1.50	1.50	1.90	1.90	1.90	2.12	2.25	2.36	2.60	3.00	3.40			
11 1/2	145	155	1.60	1.60	1.60	1.60	2.25	2.25	2.25	2.35	2.50	2.56	2.80	3.20	3.75	4.00		
12	155	165	1.70	1.70	1.70	1.70	2.60	2.60	2.60	2.85	3.05	3.45	4.10	4.50				
13	165	175	1.80	1.80	1.80	1.80	3.25	3.25	3.50	3.50	3.75	3.75	4.50	5.00	5.60	6.60		
14	175	185	1.90	1.90	1.90	1.90												
15	185	195	2.00	2.00	2.00	2.00												
16	195	205	2.10	2.10	2.10	2.10												
17	205	215	2.20	2.20	2.20	2.20												
18	215	225	2.30	2.30	2.30	2.30												
19	225	235	2.40	2.40	2.40	2.40												
20	235	245	2.50	2.50	2.50	2.50												

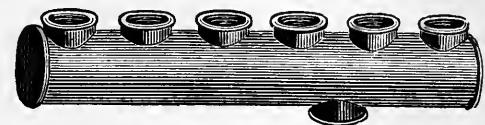
Diameter of Flanges.

A full assortment of CURVED FLANGES on hand at an advance of 50 per cent. on the net prices of above for the same size. BOSSED and OVAL FLANGES to order. FLANGES drilled to order. BLANK FLANGES, 5 cents per pound net.

BRANCH TEES.



Branch Tee, Plain.



Branch Tee, with Back Outlet.

Number of Outlets.....	2	3	4	5	6	7	8	9	10	12
$\frac{3}{4}$ -in. Outlets, 2 in. centre to centre.....	1 in. or $1\frac{1}{4}$ in. run	50	65	80	95	1.10	1.35	1.50	1.65	1.85
	$1\frac{1}{2}$ in. "	65	85	1.05	1.15	1.30	1.65	2.00	2.50	3.00
1-in. Outlets, 2 $\frac{1}{2}$ in. centre to centre.....	1 in. or $1\frac{1}{4}$ in. "	70	80	95	1.10	1.35	2.05	2.35	2.55	2.85
	$1\frac{1}{2}$ in. "	75	90	1.05	1.20	1.50	2.20	2.50	2.80	3.15
	2 in. "	1.00	1.20	1.60	1.80	2.00	2.40	2.80	3.30	4.00
	$2\frac{1}{2}$ in. "	2.10	2.50	2.90	3.25	3.60	4.00	4.50	5.00	5.50
$1\frac{1}{4}$ -in. Outlets, 3 in. centre to centre.....	$1\frac{1}{2}$ in. "	1.20	1.60	2.00	2.40	2.80	3.20	3.60	4.00	4.40
	2 in. "	1.40	1.85	2.45	2.90	3.40	3.90	4.40	5.00	5.50
$1\frac{1}{2}$ -in. Outlets, 3 $\frac{1}{2}$ in. centre to centre.....	2 in. "	1.75	2.25	2.75	3.25	3.75	4.25	4.75	5.50	6.00
										6.50

Branch Tees, with any number of Outlets, either of Cast or Wrought Iron, can be furnished.

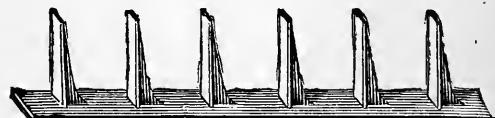
Branch Tees, with Back or Side Outlets, made to order.

Branch Tees, 2 $\frac{1}{2}$ inch run, 1 inch outlets, for wide coils, supplied.

HOOK PLATES, COIL STANDS, Etc.



Hook Plate.



Expansion Plate.

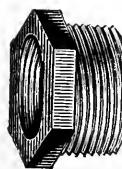


Ring Plate.



Coil Stands.

Number of Pipes	1	2	3	4	5	6	7	8	9	10	11	12
Hook plates	$\frac{3}{4}$ in.	.07	.12	.16	.20	.24	.28	.32	.36	.43	.50	.60
	1 "	.09	.15	.21	.27	.32	.40	.48	.56	.65	.70	.80
	$1\frac{1}{4}$ "	.10	.20	.30	.40	.50	.65	.75	.80	.95	1.05	1.15
	$1\frac{1}{2}$ "	.20	.40	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20
	2 "	.30	.50	.75	1.00	1.25	1.50	...	...	...	...	...
Ring plates.....	$\frac{3}{4}$ "	.13	.22	.30	.40	.50	.60	.70	.80	.95	1.15	1.35
	1 "	.15	.25	.35	.45	.55	.65	.75	.85	1.00	1.20	1.40
	$\frac{3}{4}$ "	.10	.16	.24	.34	.40	.50	.60	.70	.80	.90	1.00
Expansion plates	1 "	.12	.20	.27	.38	.45	.55	.65	.75	.85	.95	1.10
	$1\frac{1}{4}$ "	.15	.30	.38	.50	.65	.75	.90	1.05	1.20	1.35	1.50
Coil stands.....	$\frac{3}{4}$ "	per pair.			.55	...	.70	...	.85	...	1.25	...
	1 "	"	"	50	.60	...	.75	...	1.30	...	1.60	2.05



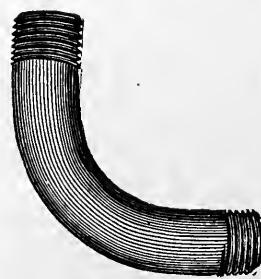
MALLEABLE IRON BUSHINGS AND UNIONS.

Bushing. Union.

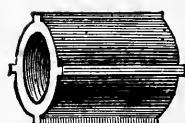
Size of Pipe.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Bushings.....	.....	.05	.06	.07	.09	.13	.17	.27	.42	.....	.....	.....
Unions, with lip	.....	.15	.18	.20	.34	.46	.60	.80	1.50	2.10	3.00	4.00
“ galvanized...”	.20	.24	.27	.37	.50	.70	.90	1.20	2.25	2.90	4.50	5.60



WROUGHT IRON FITTINGS.



Quarter Bend.



Wrought Iron Coupling.

Long Screw.



Shoulder Nipple.



Close Nipple.

Size of Pipe.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	7	8	9	10	11	12
Quarter Bends.....	.....	.....	.28	.37	.56	.77	1.12	1.65	5.75	8.50	.....	10.00	.....	.....	.....	.....	.....	.....	.....
Couplings, Plain.....	.05	.06	.07	.10	.13	.17	.21	.28	.40	.55	.80	1.00	1.65	2.40	3.25	4.25	5.25	6.25	7.50	10.00
“ Galvanized.....	.....	.08	.10	.13	.18	.25	.32	.40	.55	.80	1.05	1.40	2.25	3.25	.....	.....	.....	.....	.....	.....
Long Screws.....	.....	.30	.35	.40	.55	1.00	1.30	1.70	2.70	3.70	5.39	6.60	.....	.....	.....	.....	.....	.....	.....	.....
Nipples, Plain.....	.05	.06	.07	.09	.10	.14	.17	.25	.32	.56	.75	1.00	1.25	2.00	2.75	4.00	5.75	8.50	12.00	.....
“ Galvanized.....	.....	.08	.09	.11	.13	.17	.23	.32	.65	.85	1.15	1.40	2.40	3.50	.....	.....	.....	.....	.....	.....
Long R. & L.....	.07	.09	.10	.11	.15	.20	.25	.35	.75	.95	1.25	1.60	2.60	3.60	.....	.....	.....	.....	.....	.....
“ R. & L.....	.10	.12	.15	.18	.24	.30	.40	.50	1.00	1.25	1.50	1.75	2.75	3.75	.....	.....	.....	.....	.....	.....

COCK WRENCHES.



Size.....	Inch.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....	Each.	.04	.04	.05	.07	.09	.20	.25	.30	.45	.60

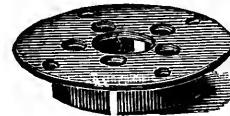
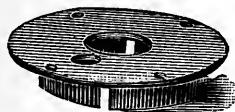
GAS PIPE HOOKS, WROUGHT IRON.



Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2			
Price, per Thousand.....	7.50	7.50	8.00	10.50	14.00	18.00	22.50	27.50			
" Hundred.....	.90	.95	1.00	1.10	1.50	1.60	3.00	3.25			
" Each.....	.01	.01	.01	.12	.02	.22	.22	.03			

Malleable Iron Hooks..... 14 cents per pound.

CEILING AND FLOOR PLATES.



Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Ceiling Plates.....	Each.	.05	.05	.08	.14	.18	.24	.32	.40	.50	.75
Floor Plates.....	"	.....	.15	.20	.25	.28	.30	.35	.45	.55	.65

BLAKE'S ADJUSTABLE PIPE HANGER.



Size.....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....	.15	.15	.18	.18	.20	.22	.25

Size.....	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	7	8
Price.....	.30	.35	.37	.40	.45	.50	.85	.95

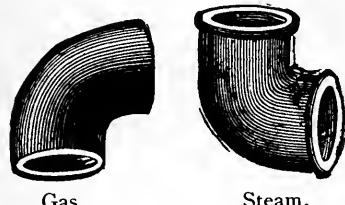
MALLEABLE IRON FITTINGS.

NOTE.—All sizes, 2-inch and under, furnished plain for Gas, and beaded for Steam, except those marked *, which are plain only.

All sizes above 2-inch have bead or band.

In ordering, be particular to mention whether for Gas or Steam.

Fittings marked † are not kept in stock, but can be made to order at special prices.



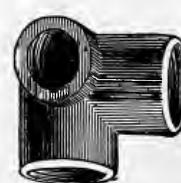
ELBOWS.

	Class.	Price per Lb.
* $\frac{1}{8}$	A	25c.
* $\frac{1}{4} \times \frac{1}{8}$	"	25
$\frac{1}{4}$	B	13
$\frac{3}{8} \times \frac{1}{8}$	A	25
$\frac{3}{8} \times \frac{1}{4}$	B	13
$\frac{3}{8}$	"	13
$\frac{1}{2} \times \frac{3}{8}$	"	13
$\frac{1}{2}$	C	II
* $\frac{3}{4} \times \frac{3}{8}$	"	II
$\frac{3}{4} \times \frac{1}{2}$	"	II
$\frac{3}{4}$	"	II
$1 \times \frac{1}{2}$	"	II
$1 \times \frac{3}{4}$	"	II
1	"	II
$1 \frac{1}{4} \times \frac{3}{4}$	"	II
$\times 1$	D	10
$1 \frac{1}{4}$	"	10
$1 \frac{1}{2} \times \frac{3}{4}$	"	10
$1 \frac{1}{2} \times 1$	"	10
$1 \frac{1}{2} \times 1 \frac{1}{4}$	"	10
$1 \frac{1}{2}$	"	10
$2 \times 1 \frac{1}{4}$	"	10
$2 \times 1 \frac{1}{2}$	"	10
2	"	10
$2 \frac{1}{2} \times 2$	"	10
$2 \frac{1}{2}$	"	10
$\frac{3}{4} \times 2$	"	10
$3 \times 2 \frac{1}{2}$	"	10
3	"	10
$3 \frac{1}{2} \times 3$	"	10
$3 \frac{1}{2}$	"	10
$4 \times 3 \frac{1}{2}$	"	10
4	"	10

STREET ELBOWS.

MALE AND FEMALE SCREW.
$\frac{1}{2}$
$\frac{3}{4} \times \frac{3}{4}$
1×1
$1 \frac{1}{4}$
$1 \frac{1}{2}$
2

Class.	Price per Lb.
B	13c.
"	13
"	13
"	13
C	II
"	II
"	II
"	II



ELBOWS WITH SIDE OUTLETS.

$\frac{3}{8} \times \frac{3}{8} \times \frac{1}{4}$	B	13
$\frac{3}{8} \times \frac{3}{8} \times \frac{3}{8}$	"	13
$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$	"	13
$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	"	13
$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	"	13
$I \times I \times I$	"	13

MALLEABLE IRON FITTINGS—Continued.



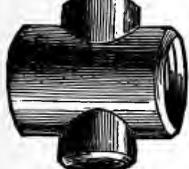
Gas.

Steam.

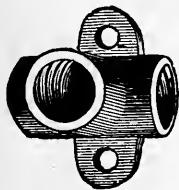
TEES.

	Class.	Price per Lb.	TEES—Continued.	Class.	Price per Lb.
* $\frac{1}{8}$	A	25	* $\frac{1}{4}$ x $\frac{3}{8}$ x $1\frac{1}{4}$	D	10C.
* $\frac{1}{8}$ x $\frac{1}{4}$	"	25	* $\frac{1}{4}$ x $\frac{1}{2}$ x I	"	10
* $\frac{1}{4}$ x $\frac{1}{8}$	"	25	* $\frac{1}{4}$ x $\frac{1}{2}$ x $1\frac{1}{4}$	"	10
$\frac{1}{4}$	B	13	$\frac{1}{4}$ x $\frac{3}{4}$ x $1\frac{1}{4}$	"	10
* $\frac{1}{4}$ x $\frac{3}{8}$	"	13	$\frac{1}{4}$ x I x $\frac{3}{8}$	"	10
* $\frac{3}{8}$ x $\frac{1}{4}$ x $\frac{1}{4}$	"	13	* $\frac{1}{4}$ x I x $\frac{1}{2}$	"	10
* $\frac{3}{8}$ x $\frac{1}{4}$ x $\frac{3}{8}$	"	13	$\frac{1}{4}$ x I x $1\frac{1}{4}$	"	10
* $\frac{3}{8}$ x $\frac{1}{8}$	A	25	$\frac{1}{4}$ x I	"	10
$\frac{3}{8}$ x $\frac{1}{4}$	B	13	$\frac{1}{4}$ x $\frac{1}{2}$ x $1\frac{1}{2}$	"	10
$\frac{3}{8}$ x $\frac{1}{2}$	"	13	* $\frac{1}{2}$ x $\frac{1}{2}$ x I	"	10
+ $\frac{1}{2}$ x $\frac{1}{4}$ x $\frac{3}{8}$	"	13	* $\frac{1}{2}$ x $\frac{1}{2}$ x $1\frac{1}{2}$	"	10
* $\frac{1}{2}$ x $\frac{3}{8}$ x $\frac{1}{4}$	"	13	+ $\frac{1}{2}$ x $\frac{3}{4}$ x $1\frac{1}{4}$	"	10
* $\frac{1}{2}$ x $\frac{3}{8}$ x $\frac{3}{8}$	"	13	$\frac{1}{2}$ x $\frac{3}{4}$ x $1\frac{1}{2}$	"	10
* $\frac{1}{2}$ x $\frac{3}{8}$ x $\frac{1}{2}$	"	13	+ $\frac{1}{2}$ x I x $\frac{3}{4}$	"	10
$\frac{1}{2}$ x $\frac{3}{8}$ x $\frac{3}{4}$	"	13	* $\frac{1}{2}$ x I x $1\frac{1}{4}$	"	10
* $\frac{1}{2}$ x $\frac{1}{4}$	"	13	$\frac{1}{2}$ x I x $1\frac{1}{2}$	"	10
$\frac{1}{2}$ x $\frac{3}{8}$	C	13	* $\frac{1}{2}$ x I $\frac{1}{4}$ x $\frac{3}{4}$	"	10
$\frac{1}{2}$ x $\frac{3}{4}$	II	II	$\frac{1}{2}$ x I $\frac{1}{4}$ x I	"	10
* $\frac{3}{4}$ x $\frac{3}{8}$ x $\frac{1}{2}$	"	II	$\frac{1}{2}$ x I $\frac{1}{4}$ x $1\frac{1}{4}$	"	10
* $\frac{3}{4}$ x $\frac{3}{8}$ x $\frac{3}{4}$	"	II	$\frac{1}{2}$ x I $\frac{1}{4}$ x $1\frac{1}{2}$	"	10
+ $\frac{3}{4}$ x $\frac{3}{8}$ x I	"	II	$\frac{1}{2}$ x $\frac{3}{8}$	"	10
$\frac{3}{4}$ x $\frac{1}{2}$ x $\frac{1}{4}$	"	II	$\frac{1}{2}$ x $\frac{1}{2}$	"	10
* $\frac{3}{4}$ x $\frac{1}{2}$ x $\frac{3}{8}$	"	II	$\frac{1}{2}$ x $\frac{3}{4}$	"	10
$\frac{3}{4}$ x $\frac{1}{2}$ x $\frac{1}{2}$	"	II	$\frac{1}{2}$ x I	"	10
$\frac{3}{4}$ x $\frac{1}{2}$ x $\frac{3}{4}$	"	II	$\frac{1}{2}$ x I $\frac{1}{4}$	"	10
* $\frac{3}{4}$ x $\frac{1}{2}$ x I	"	II	$\frac{1}{2}$ x 2	"	10
* $\frac{3}{4}$ x $\frac{1}{4}$	"	II	2 x $\frac{1}{2}$ x 2	"	10
$\frac{3}{4}$ x $\frac{3}{8}$	"	II	2 x $\frac{3}{4}$ x 2	"	10
$\frac{3}{4}$ x $\frac{1}{2}$	"	II	2 x I x 2	"	10
$\frac{3}{4}$ x I	"	II	+2 x I $\frac{1}{4}$ x I $\frac{1}{4}$	"	10
$\frac{1}{2}$ x $\frac{3}{8}$ x $\frac{1}{2}$	"	II	2 x I $\frac{1}{4}$ x $1\frac{1}{2}$	"	10
* $\frac{1}{2}$ x $\frac{3}{8}$ x $\frac{3}{4}$	"	II	2 x I $\frac{1}{4}$ x 2	"	10
* $\frac{1}{2}$ x $\frac{3}{8}$ x I	"	II	2 x I $\frac{1}{2}$ x I $\frac{1}{4}$	"	10
+ $\frac{1}{2}$ x $\frac{3}{8}$ x $1\frac{1}{4}$	"	II	2 x I $\frac{1}{2}$ x I $\frac{1}{2}$	"	10
+ $\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{3}{8}$	"	II	2 x I $\frac{1}{2}$ x 2	"	10
$\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{1}{2}$	"	II	+2 x $\frac{3}{8}$	"	10
$\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{3}{4}$	"	II	2 x $\frac{1}{2}$	"	10
* $\frac{1}{2}$ x $\frac{1}{2}$ x I	"	II	2 x $\frac{3}{4}$	"	10
+ $\frac{1}{2}$ x $\frac{1}{2}$ x $1\frac{1}{4}$	"	II	2 x I	"	10
I x $\frac{3}{4}$ x $\frac{3}{8}$	"	II	2 x I $\frac{1}{4}$	"	10
I x $\frac{3}{4}$ x $\frac{1}{2}$	"	II	2 x I $\frac{1}{2}$	"	10
I x $\frac{3}{4}$ x $\frac{3}{4}$	"	II	2	"	10
I x $\frac{3}{4}$ x I	"	II	2 x $2\frac{1}{2}$	"	10
*I x $\frac{3}{4}$ x I $\frac{1}{4}$	"	II	$2\frac{1}{2}$ x I	"	10
I x $\frac{1}{4}$	"	II	$2\frac{1}{2}$ x I $\frac{1}{4}$	"	10
I x $\frac{3}{8}$	"	II	$2\frac{1}{2}$ x I $\frac{1}{2}$	"	10
I x $\frac{1}{2}$	"	II	$2\frac{1}{2}$ x 2	"	10
I x $\frac{3}{4}$	"	II	$2\frac{1}{2}$	"	10
I x $\frac{1}{4}$ x I	"	II	3 x I $\frac{1}{4}$	"	10
*I x $\frac{3}{4}$ x I $\frac{1}{4}$	"	II	3 x I $\frac{1}{2}$	"	10
I x $\frac{1}{4}$	"	II	3 x 2	"	10
I x $\frac{1}{4}$ x I	"	II	3 x $2\frac{1}{2}$	"	10
+I $\frac{1}{4}$ x $\frac{3}{8}$ x I	"	II			

MALLEABLE IRON FITTINGS—Continued.

TEES—Continued.	Class.	Price per Lb.	CROSSES—Continued.	Class.	Price per Lb.
3	C	10c.	2½	C	11c.
3½ x 2½	"	10	3 x 2	"	II
3½ x 3	"	10	3 x 2½	"	II
3½	"	10	3	"	II
4 x 3	"	10	3½	"	II
4 x 3½	"	10	4	"	II
4	"	10			
	Gas.			Steam.	
CROSSES.					
1½	B	13	1¼ x 1¼	B	13
*3/8 x 1/4	"	13	3/8 x 1/4	"	13
3/8	"	13	3/8 x 3/8	"	13
*1/2 x 3/8 x 1/4	"	13	1/2 x 1/2	"	13
*1/2 x 3/8 x 3/8	"	13	3/4 x 3/4	"	13
*1/2 x 3/8 x 1/2	"	13			
*1/2 x 1/4	"	13			
*1/2 x 3/8	"	13			
*1/2	"	13			
*3/4 x 3/8 x 1/2	"	13			
*3/4 x 1/2 x 3/8	"	13			
*3/4 x 1/2 x 1/2	"	13			
3/4 x 3/8	"	13			
3/4 x 1/2	"	13			
3/4	"	13			
*1 x 1/2 x 3/8	"	13			
*1 x 3/4 x 3/8	"	13			
*1 x 3/4 x 1/2	"	13			
*1 x 3/4 x 3/2	"	13			
1 x 3/8	"	13			
1 x 1/2	"	13			
1 x 3/4	"	13			
1	"	13			
*1 1/4 x 1 x 3/4	C	II			
*1 1/4 x 1 x 1	"	II			
1 1/4 x 3/8	"	II			
1 1/4 x 1/2	"	II			
1 1/4 x 3/4	"	II			
1 1/4 x 1	"	II			
1 1/4	"	II			
*1 1/2 x 1 1/4 x 1 1/4	"	II	3/8 x 3/8	B	13
*1 1/2 x 3/8	"	II	1/4 x 3/8	"	13
1 1/2 x 1/2	"	II			
1 1/2 x 3/4	"	II			
1 1/2 x 1	"	II			
*1 1/2 x 1 1/4	"	II			
1 1/2 x 1/2	"	II			
2 x 3/4	"	II			
2 x 1	"	II			
2 x 1 1/4	"	II			
2 x 1 1/2	"	II			
2	"	II			
2 1/2 x 2	"	II	1/4 x 3/8	B	13
			3/8 x 3/8	"	13

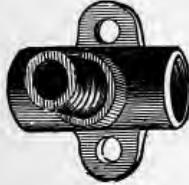
MALLEABLE IRON FITTINGS—Continued.



DROP TEES.

FEMALE.

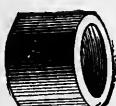
$\frac{3}{8}$	X	$\frac{1}{4}$	X	$\frac{1}{4}$	.
$\frac{3}{8}$	X	$\frac{3}{8}$	X	$\frac{1}{4}$	.
$\frac{3}{8}$	X	$\frac{3}{8}$	X	$\frac{3}{8}$	.
$\frac{1}{2}$	X	$\frac{1}{4}$	X	$\frac{1}{2}$	.
$\frac{1}{2}$	X	$\frac{3}{8}$	X	$\frac{1}{4}$	.
$\frac{1}{2}$	X	$\frac{3}{8}$	X	$\frac{3}{8}$	.
$\frac{1}{2}$	X	$\frac{1}{2}$	X	$\frac{1}{4}$	.
$\frac{1}{2}$	X	$\frac{1}{2}$	X	$\frac{3}{8}$	.
$\frac{1}{2}$	X	$\frac{1}{2}$	X	$\frac{1}{2}$	.
$\frac{3}{4}$	X	$\frac{1}{2}$	X	$\frac{1}{4}$	.
$\frac{3}{4}$	X	$\frac{1}{2}$	X	$\frac{3}{8}$	.
$\frac{3}{4}$	X	$\frac{3}{4}$	X	$\frac{1}{4}$	.
$\frac{3}{4}$	X	$\frac{3}{4}$	X	$\frac{3}{8}$	.
$\frac{3}{4}$	X	$\frac{3}{4}$	X	$\frac{1}{2}$	.
$\frac{3}{4}$	X	$\frac{3}{4}$	X	$\frac{3}{8}$	.
I	X	$\frac{3}{4}$	X	$\frac{3}{8}$	.
I	X	I	X	$\frac{3}{8}$	.
I	X	I	X	$\frac{1}{2}$	.



DROP TEES.

MALE AND FEMALE.

$\frac{1}{4}$	\times	$\frac{1}{4}$	\times	$\frac{3}{8}$	.	.	.
$\frac{3}{8}$	\times	$\frac{1}{4}$	\times	$\frac{3}{8}$	.	.	.
$\frac{3}{8}$	\times	$\frac{3}{8}$	\times	$\frac{3}{8}$	.	.	.
$\frac{1}{2}$	\times	$\frac{3}{8}$	\times	$\frac{3}{8}$	.	.	.
$\frac{1}{2}$	\times	$\frac{1}{2}$	\times	$\frac{3}{8}$	.	.	.
$\frac{3}{4}$	\times	$\frac{1}{2}$	\times	$\frac{3}{8}$	.	.	.
$\frac{3}{4}$	\times	$\frac{3}{4}$	\times	$\frac{3}{8}$	.	.	.
I	\times	$\frac{3}{4}$	\times	$\frac{3}{8}$	.	.	.
I	X	I	X	$\frac{3}{8}$	.	.	.



CAPS.

CARTS.	
$\frac{1}{4}$	.....
$\frac{3}{8}$	.....
$\frac{1}{2}$	.....
$\frac{3}{4}$	.....
I	.....
I $\frac{1}{4}$	.....
I $\frac{1}{2}$	.....
2	.....
2 $\frac{1}{2}$	.....

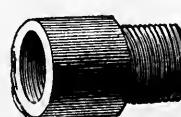


PLUGS.



REDUCING COUPLINGS.

$\frac{1}{4}$	x	$\frac{1}{8}$		A	25
$\frac{3}{8}$	x	$\frac{1}{8}$		"	25
$\frac{3}{8}$	x	$\frac{1}{4}$		B	13
$\frac{1}{2}$	x	$\frac{1}{4}$		"	13
$\frac{1}{2}$	x	$\frac{3}{8}$		"	13
$\frac{3}{4}$	x	$\frac{1}{4}$		"	13
$\frac{3}{4}$	x	$\frac{3}{8}$		"	13
$\frac{3}{4}$	x	$\frac{1}{2}$		"	13
I	x	$\frac{3}{8}$		"	13
I	x	$\frac{1}{2}$		"	13
I	x	$\frac{3}{4}$		"	13
$1\frac{1}{4}$	x	$\frac{1}{2}$		C	11
$1\frac{1}{4}$	x	$\frac{3}{4}$		"	11
$1\frac{1}{4}$	x	I		"	11
$1\frac{1}{2}$	x	$\frac{1}{2}$		"	11
$1\frac{1}{2}$	x	$\frac{3}{4}$		"	11
$1\frac{1}{2}$	x	I		"	11
$1\frac{1}{2}$	x	$1\frac{1}{4}$		"	11
$\frac{1}{2}$	x	$\frac{3}{4}$		"	11
2	x	I		"	11
2	x	$I\frac{1}{4}$		"	11
2	x	$I\frac{1}{2}$		"	11
$2\frac{1}{2}$	x	I		"	11
$2\frac{1}{2}$	x	$I\frac{1}{4}$		"	11
$2\frac{1}{2}$	x	$I\frac{1}{2}$		"	11
$2\frac{1}{2}$	x	2		"	11
$\frac{3}{2}$	x	I		"	11
$\frac{3}{2}$	x	$I\frac{1}{4}$		"	11
$\frac{3}{2}$	x	$I\frac{1}{2}$		"	11
3	x	2		"	11
3	x	$2\frac{1}{4}$		"	11



EXTENSION PIECES.

MALE AND FEMALE.

MALE AND FEMALE. | B | 13

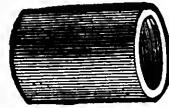
VOID—SEE REVISED PRICES.

MALLEABLE IRON FITTINGS—Continued.



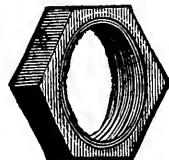
COUPLINGS.
RIGHT AND LEFT.

$\frac{1}{4}$	B	13c.
$\frac{3}{8}$	"	13
$\frac{1}{2}$	"	13
$\frac{3}{4}$	"	13
I	C	II
$1\frac{1}{4}$	"	II
$1\frac{1}{2}$	"	II
2	"	II



COUPLINGS.
RIGHT HAND.

$\frac{1}{8}$	A	25
$\frac{1}{4}$	B	13
$\frac{3}{8}$	"	13
$\frac{1}{2}$	C	II
$\frac{3}{4}$	"	II
I	"	II
$1\frac{1}{4}$	D	10
$1\frac{1}{2}$	"	10
2	"	10



LOCK-NUTS.

$\frac{1}{4}$	B	13
$\frac{3}{8}$	"	13
$\frac{1}{2}$	"	13
$\frac{3}{4}$	"	13
I	"	13
$1\frac{1}{4}$	C	II
$1\frac{1}{2}$	"	II
2	"	II



STRAPS.
TINNED.

$\frac{1}{4}$	C	16
$\frac{3}{8}$	"	16
$\frac{1}{2}$	"	16
$\frac{3}{4}$	"	16
I	"	16



WASTE-NUTS.

TINNED.

$\frac{1}{4}$	B	18c.
$\frac{3}{8}$	"	18
$\frac{1}{2}$	"	18
$\frac{3}{4}$	"	18
I	"	18



CHANDELIER HOOKS.

$\frac{3}{8}$	B	13
$\frac{1}{2}$	"	13



GAS-COCK WRENCHES.

$\frac{1}{4}$	C	II
$\frac{3}{8}$	"	II
$\frac{1}{2}$	"	II
$\frac{3}{4}$	"	II
I	"	II
$1\frac{1}{4}$	"	II
$1\frac{1}{2}$	"	II
2	"	II



RETURN BENDS.

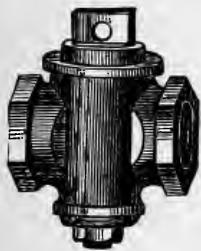
OPEN OR CLOSE.

$\frac{1}{2}$	B	13
$\frac{3}{4}$	"	13
I	C	II
$1\frac{1}{4}$	"	II
$1\frac{1}{2}$	"	II
2	"	II
$2\frac{1}{2}$	"	II

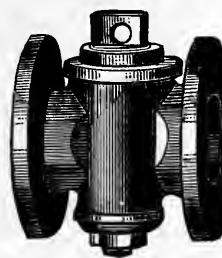
GALVANIZED AND TINNED FITTINGS, 5 cents additional per pound.

VOID—SEE REVISED PRICES.

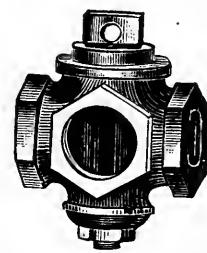
IRON STOP COCKS.



Screwed Ends.



Flanged Ends.



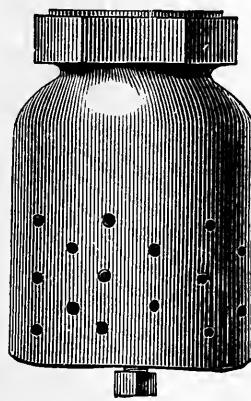
Three-way Cock—Screwed.

Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
All Iron, Screwed.....	.75	.80	.90	1.25	1.50	2.00	2.60	4.50	6.50	12.00	16.00
" " Brass Plugs.....	1.10	1.20	1.60	2.00	2.75	4.00	5.00	9.50	13.50	30.00	40.00
" " Flanged.....	.....	.....	1.65	2.25	2.75	3.50	4.35	6.50	9.50	15.50	20.00
" " Flanged, Brass Plugs.....	.....	.....	2.35	3.00	4.00	5.50	6.75	11.50	16.50	33.50	44.00
Three-way, all Iron, Flanged.....	.....	.....	1.30	1.75	2.00	2.75	4.00	6.00	8.50	15.00	20.00
" Brass Plugs.....	.....	.....	2.00	2.50	3.25	4.75	6.50	11.00	15.50	33.00	44.00
" all Iron, Flanged.....	.....	.....	2.30	3.25	3.75	5.00	6.50	9.00	13.00	20.25	26.00
" Brass Plugs.....	.....	.....	3.00	4.00	5.00	7.00	9.00	14.00	20.00	38.25	50.00

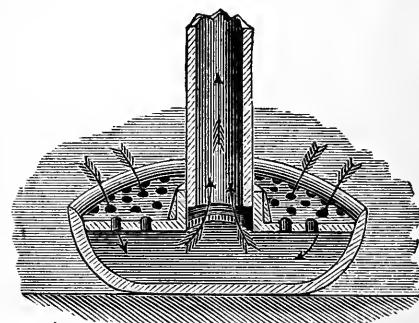
FOOT VALVES AND STRAINERS.



Iron Foot Valve and Strainer.



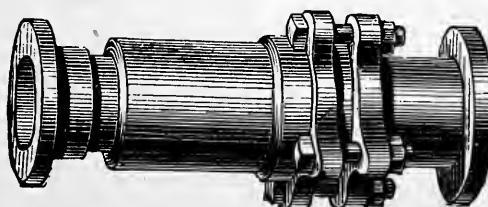
Nason's Improved Foot Valve and Strainer.



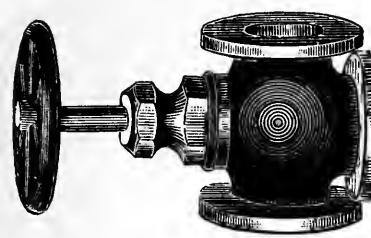
Mushroom Strainer.

Size.....	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6	8
Foot valve and strainer.	1.50	1.75	2.50	3.25	4.25	5.50	10.00	13.00	24.00	50.00
Nason's valve and strainer	2.00	2.25	2.50	3.25	4.25	5.50	10.00	13.00	24.00	.....
Mushroom strainer.....	1.00	1.25	1.75	2.25	2.75	3.50	.....	.....	.....	.....

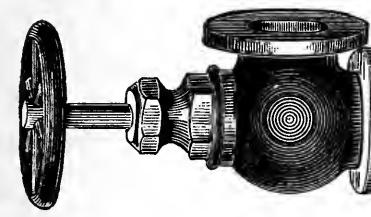
EXPANSION JOINTS.



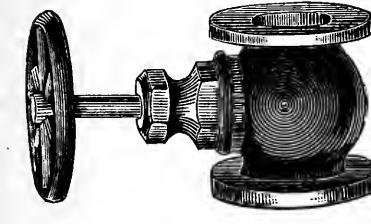
Size	$1\frac{1}{2}$ in.	2 in.	$2\frac{1}{2}$ in.	3 in.	4 in.	5 in.	6 in.	8 in.
Length of travel.....	4 $\frac{1}{2}$ in.	5 in.	6 in.	6 in.	6 in.	6 in.	6 in.	6 in.
Price, screwed ends.....	7.00	11.00	13.00	17.50	30.00	45.00	55.00	100.00
" flanged " .....	.....	18.00	20.00	25.00	40.00	55.00	65.00	110.00



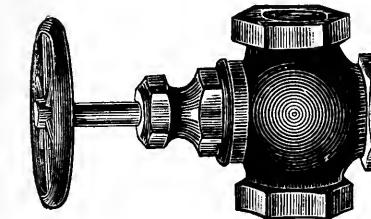
Flanged Cross Valve.



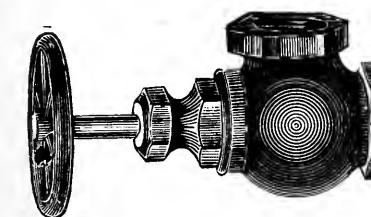
Flanged Angle Valve.



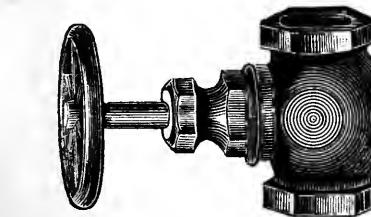
Flanged Globe Valve.



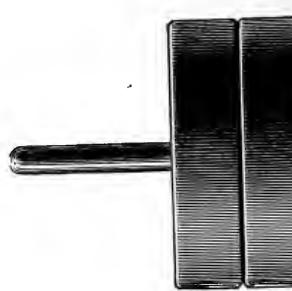
Cross Valve.



Angle Valve.



Globe Valve.

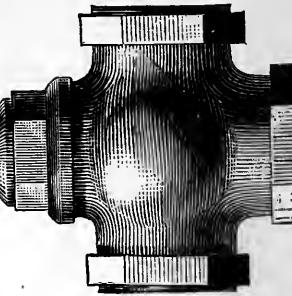


Horizontal Check Valves.

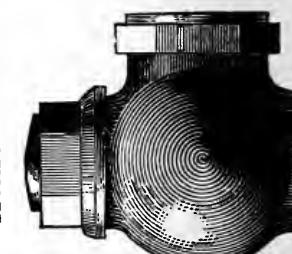
Cross Valve with Yoke.

Angle Valve with Yoke.

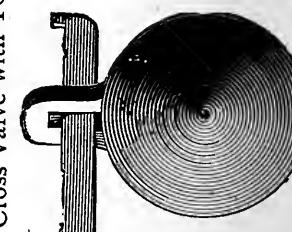
Globe Valve with Yoke.



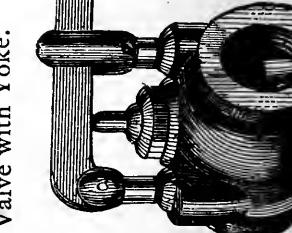
Safety Valve—Low Pressure.



Angle Check Valve.



Safety Valve.

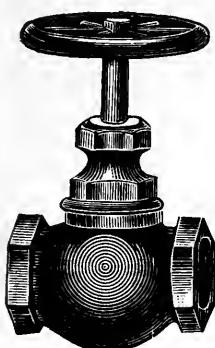


Back Pressure Valve.

IRON BODY VALVES, BRASS MOUNTED.

Size	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	7	8
Globe and Angle Valves.													
Screwed Ends	2.00	2.50	3.50	5.00	7.50	10.50	...	...	...	...	...	...	...
“ Heavy Pattern	2.50	2.90	3.75	5.35	12.25	15.00	...	...	...	...	...	...	...
Flanged Ends	3.00	3.75	5.00	6.75	9.50	13.50	...	...	...	...	...	...	...
“ Heavy Pattern	3.50	3.75	5.00	6.75	13.25	16.00	20.00	28.50	37.00	49.00	61.00	77.00	...
With Yoke, Screwed	...	...	...	8.00	10.50	14.50	18.00	21.00	32.00	44.00	75.00	85.00	...
“ “ Heavy Pattern	...	...	...	8.00	12.25	15.00	19.00	27.50	35.50	48.00	75.00	85.00	...
Flanged	...	...	...	...	9.75	12.50	17.50	21.50	25.00	36.00	49.00	80.00	91.00
“ “ Heavy Pattern	...	...	...	9.75	13.25	17.50	21.50	28.50	37.00	49.00	80.00	91.00	...
Check Valves, Horizontal or Angle.													
Screwed Ends	1.50	2.25	2.75	3.75	6.25	9.75	12.75	15.00	24.00	33.00	55.00	65.00	...
“ Heavy Pattern	1.75	2.25	2.75	3.75	8.25	10.00	13.00	18.50	25.00	33.00	55.00	65.00	...
Flanged Ends	2.50	3.50	4.25	5.50	8.25	12.75	16.25	19.00	28.00	38.00	60.00	71.00	...
“ Heavy Pattern	3.00	3.50	4.60	9.50	11.50	14.50	20.00	26.00	34.00	42.50	60.00	71.00	...
Cross Valves.													
Screwed Ends	3.10	4.00	6.50	12.50	16.50	20.50	29.50	33.50	51.00	...	...	...	...
Flanged	...	...	...	9.00	13.50	18.50	21.50	30.50	34.50	53.00	...	...	...
Safety Valves.													
Screwed Ends	2.50	3.50	5.00	6.00	8.00	13.00	18.00	24.00	30.00	44.00	60.00	145.00	...
“ Heavy Pattern	2.50	3.50	5.00	6.00	8.00	16.00	20.00	26.00	31.00	44.00	60.00	145.00	...
Flanged Ends	3.50	5.00	6.75	8.25	10.50	16.00	22.50	29.25	36.00	50.00	67.50	154.00	...
“ Heavy Pattern	3.50	5.00	6.75	8.25	10.50	16.50	22.50	29.25	36.00	50.00	67.50	154.00	...
Low Pressure,	“	...	...	2.50	3.50	5.00	6.00	8.00	16.00	20.00	31.00	...	...
Back Pressure Valves.				...	...	7.00	8.00	10.50	14.50	18.00	21.00	32.00	44.00
Screwed Ends	“	...	...	...	...	8.50	9.75	12.50	17.50	21.50	25.00	36.00	49.00
Flanged	“	...	...	...	...	...	...	...	...	...	...	80.00	91.00

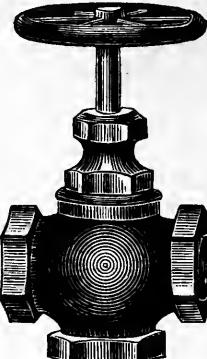
BRASS VALVES, COCKS, Etc.



Globe Valve.



Angle Valve.



Cross Valve.



Safety Valve.



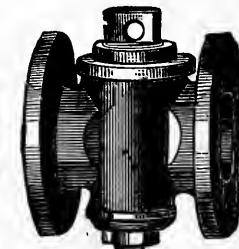
Horizontal Check Valve, screwed.



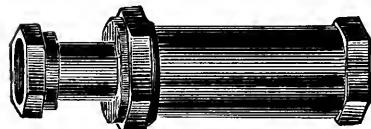
Angle Check Valve, screwed.



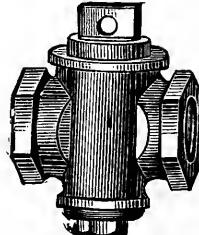
Vertical Check Valve, screwed.



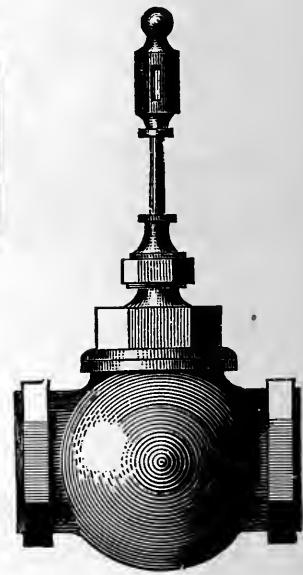
Steam Cock Flanged ends.



Expansion Joint.



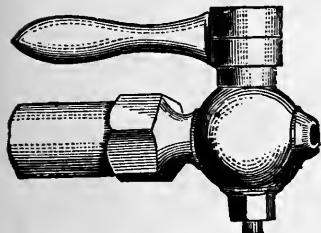
Steam Cock.



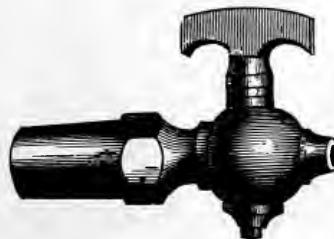
Balance Disc, Governor Valve.

Size.....	1/8	1/4	3/8	1/2	5/8	1	1 1/4	1 1/2	2	2 1/2	3	
Globe and Angle Valves:												
Screwed .....	.60	.60	.75	1.00	1.35	1.80	2.80	3.90	5.90	11.25	16.00
Flanged .....	.....	.....	.....	3.50	4.00	5.00	7.00	9.00	14.00	20.00	30.00
Heavy pattern, screwed.....	.80	.80	.95	1.25	1.85	2.50	4.35	5.25	7.80	18.00	24.50	
Check Valves:												
Screwed .....	.50	.50	.60	.85	1.15	1.55	2.30	3.25	5.20	10.00	14.00
Flanged .....	.....	.....	.....	3.25	3.75	4.50	6.50	8.50	13.00	19.00	28.00
Screwed, heavy pattern .....	.65	.65	.75	1.15	1.60	2.00	3.25	4.50	6.75	12.50	17.00
Cross Valves, heavy pattern:												
Screwed.....	.....	.88	1.08	1.50	2.10	3.15	5.00	6.00	9.00	16.00	24.00
Flanged .....	.....	.....	.....	.....	.....	7.00	10.00	14.00	21.00	30.00	45.00
Safety Valves:												
Screwed.....	.....	2.00	2.25	2.75	3.50	5.00	7.00	8.50	12.00	20.00	30.00
Flanged .....	.....	.....	.....	.....	.....	9.50	13.50	17.50	25.00	34.00	50.00
Low pressure, heavy pattern .....	.....	.....	.....	.....	.....	5.00	7.00	8.50	.....	.....	.....
Balance Disc Governor Valves	.....	.....	.....	.....	.....	5.00	7.50	9.00	15.00	.....	.....
Steam Cocks:												
Screwed70	.70	.75	1.10	1.50	2.25	3.75	4.80	7.25	14.00	20.00
With handle.....80	.80	.85	1.20	1.65	2.50	4.15	5.20	7.75
Flanged .....	.....	.....	.....	3.50	4.50	5.50	8.00	10.00	15.00	22.00	32.00
With handle.....	.....	.....	.....	3.60	4.65	5.75	8.45	10.40	15.50	.....	.....
Screwed, heavy pattern.....80	.80	1.10	1.46	2.04	2.90	4.50	6.25	9.10	17.00	25.50
Flanged, " " .....	.....	.....	.....	3.50	4.50	6.00	9.00	12.00	16.00	24.00	40.00
Three-way, screwed .....	.....	.....	.....	1.65	2.25	3.40	5.50	7.00	10.00	18.00	26.00
" " flanged.....	.....	.....	.....	5.25	6.50	7.75	10.00	14.00	22.00	31.00	39.00
Expansion Joints:												
To Travel.....	.....	.....	.....	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/2	2 1/2	2 3/4
Price .....	.....	.....	.....	2.40	2.75	3.25	4.40	5.50	8.00	16.00	24.00

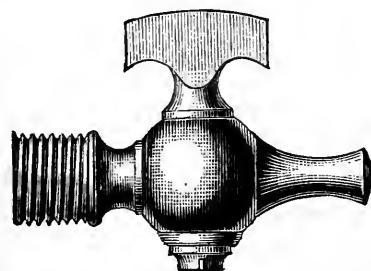
AIR, CYLINDER AND GAUGE COCKS.



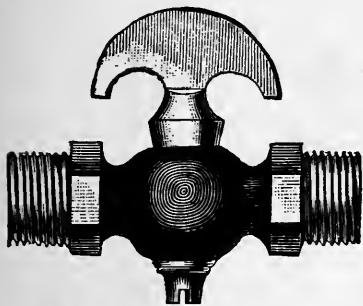
Cylinder Cock—Lever Handle.



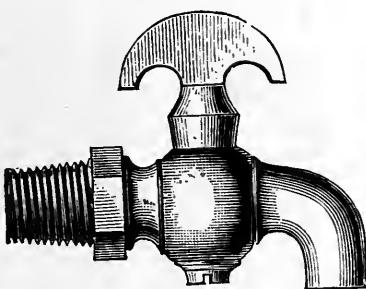
Cylinder Cock—T Handle.



Single End Air Cock.



Double End Air Cock.



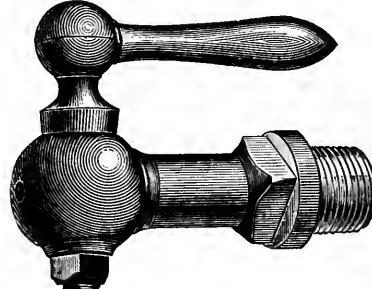
Bibb End Air Cock.



Wood Handle Gauge Cock.



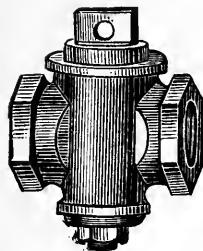
Mississippi Gauge Cock.



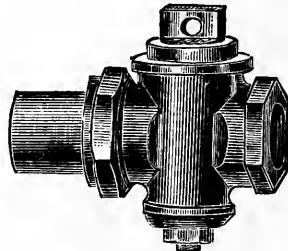
Lever Handle Gauge Cock.

Size.	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	I
Cylinder Cocks:						
Long shank .....		.90	.90	1.00	1.50	2.25
Screw		1.00	1.00	1.35	2.00	3.00
Bibb nozzle		1.20	1.40	1.80	.....	.....
Air Cocks:						
Single thread.....	.40	.45	.85	1.40	.....	.....
Double .....	.45	.50	.95	1.60	.....	.....
Long Shank .....		.70	1.25	.....	.....	.....
Compression.....	.45	.50	.75	1.00	.....	.....
Air Cocks, Bibb Nozzle:						
Single thread.....	.65	.70	1.10	1.75	.....	.....
Double .....	.70	.75	1.15	2.00	.....	.....
Gauge Cocks:						
Compression.....			.85	1.00	1.25	.....
Wood handle.....			.85	1.00	1.25	.....
Mississippi.....				.60	1.00	1.50

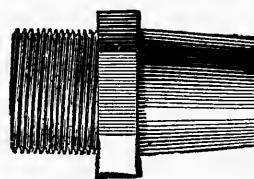
GAS COCKS AND SOLDERING FITTINGS.



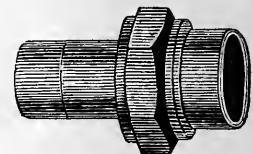
Service Cock.



Union Meter Cock.

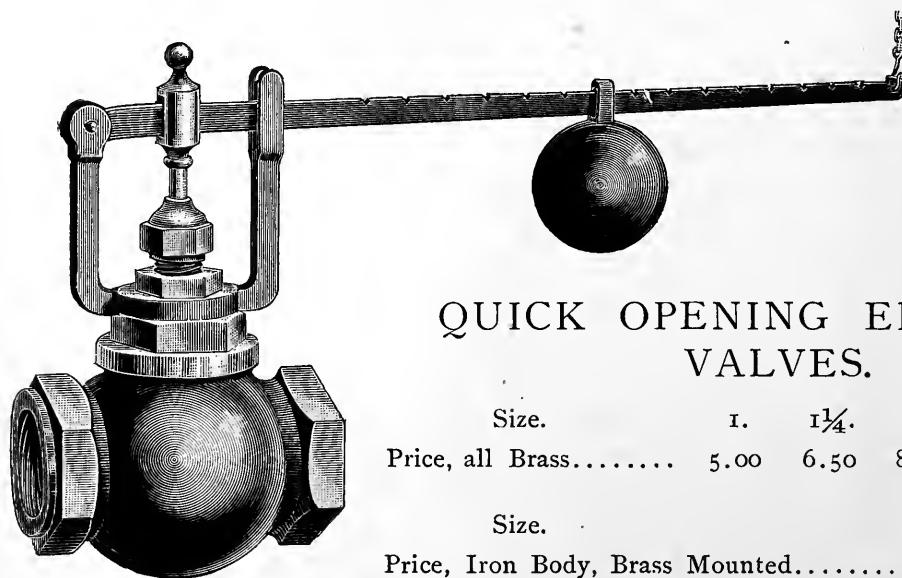


Soldering Nipple.



Soldering Union.

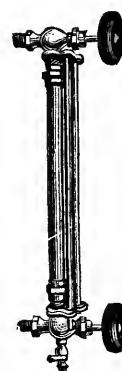
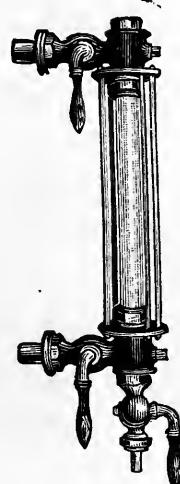
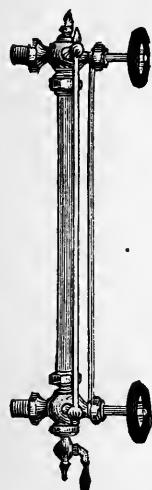
Sizes.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Gas Service Cocks:											
Heavy pattern .....	.65	.65	.75	.85	1.20	1.70	2.60	3.60	6.00	11.50	17.00
With handle.....	.75	.75	.85	.95	1.35	1.95	3.00	4.00	6.50	.....	.....
Meter Cocks:											
Heavy pattern.....				.95	1.40	2.00	3.00	4.20	6.75	13.00	19.00
With handle.....				1.05	1.55	2.25	3.40	4.60	7.25	.....	.....
Union Meter Cocks:											
Heavy pattern.....				1.10	1.50	2.30	3.40	4.85	7.75	.....	.....
With handle.....				1.20	1.65	2.55	3.80	5.25	8.25	.....	.....
Soldering Unions:											
Per dozen	2.00	2.25	2.75	3.25	4.00	6.00	8.50	12.00	18.00	24.00	33.00
Soldering Nipples:											
Per dozen	1.50	1.75	2.25	2.50	3.00	5.00	7.50	10.00	14.00	20.00	28.00



QUICK OPENING ELEVATOR VALVES.

Size.	1.	$1\frac{1}{4}$.	$1\frac{1}{2}$.	2.	$2\frac{1}{2}$.
Price, all Brass.....	5.00	6.50	8.50	13.00	21.00
Size.				3 in.	4 in.
Price, Iron Body, Brass Mounted.....				32.00	50.00

WATER GAUGES.



Numbers.	00	0	1	3	3½	7	8	9
Diameter of Glass.....	5/8 in.	3/4 in.						
Finished, no guards.....	4.50	5.00	3.25
“ 2 guards.....	3.90	4.10	4.75
“ 4 guards.....	6.25	7.50
Length of Glass.....	12 in.	16 in.						

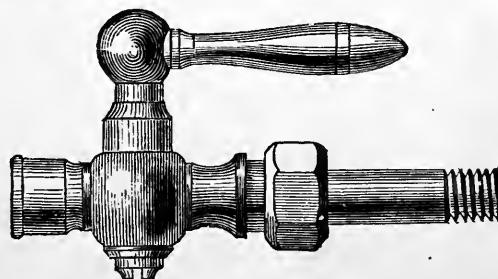
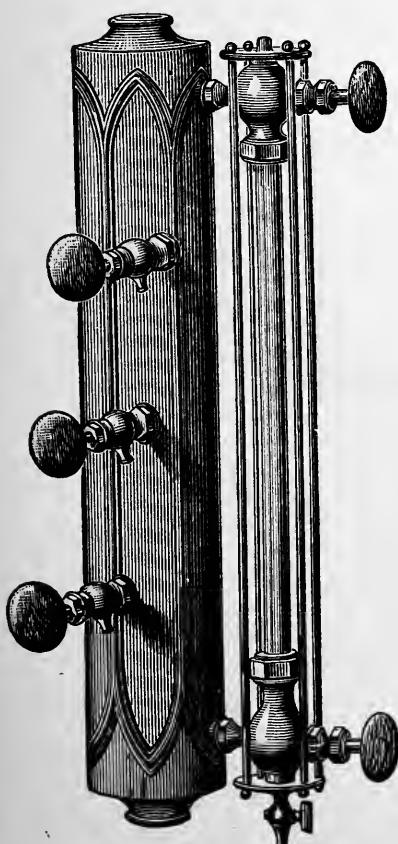
NASON'S
IMPROVED WATER COLUMN.

NEW IN DESIGN AND NEAT IN APPEARANCE.

Nos.	1.	2.
Price, without Trimmings.....	\$1.50	\$2.00...Net.
Price, with Three Gauge Cocks and Water Gauge.....	5.00	7.00...Net.
Price, complete, with Gauge Cocks, Water and Steam Gauges....	8.00	10.00...Net.

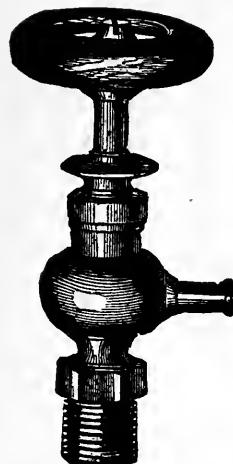
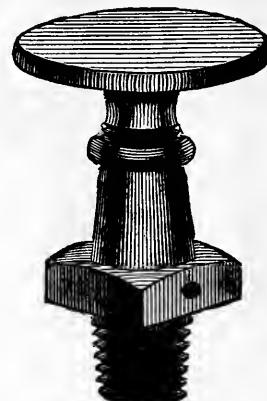
STEAM GAUGE COCKS.

Plain T Handle.....	\$0.75
Plain Lever Handle.....	0.90
With Union T Handle.....	1.85
With Union Lever Handle.....	2.00



With Union, Lever Handle.

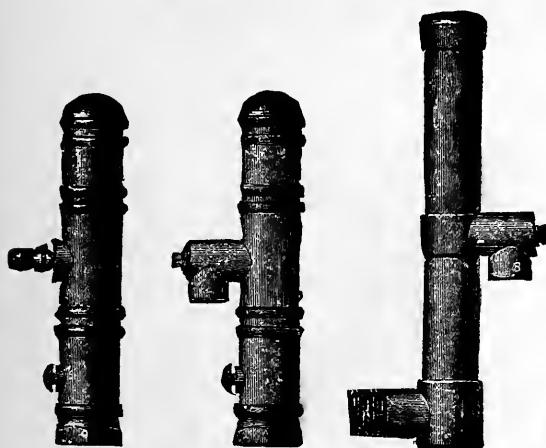
RADIATOR VALVES AND COCKS.

Radiator Air Cock,
Wood Wheel.Radiator Valve,
Wood Wheel.Radiator Air Cock,
Brass Wheel.Radiator Angle Valve,
with Spindle and Key.

Size.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Radiator Angle Valves, Wood Wheel or Tee Handle:						
Rough Body, plain	1.35	1.60	2.25	3.25	4.50	7.00
" " with Union	2.05	2.45	3.25	4.50	6.50	10.00
" " plated Trimmings	1.55	1.85	2.40	3.60	4.85	7.25
" " with Union	2.20	2.60	3.35	4.90	6.65	10.25
" " all over	1.65	1.95	2.65	3.70	5.00	7.75
" " with Union	2.40	2.85	3.65	5.05	7.10	10.85
Finished Body, plain	1.85	2.15	2.85	4.00	5.50	8.50
" " with Union	2.55	3.00	3.85	5.25	7.50	11.50
" " plated all over	2.15	2.50	3.25	4.45	6.00	9.25
" " with Union	2.90	3.40	4.30	5.80	8.10	12.35
Radiator Air Cocks	$\frac{1}{8}$ in.	$\frac{1}{4}$ in.	$\frac{3}{8}$ in.	...	...	...
Brass Wheel, finished	0.35	0.40	0.45	...	...	...
" " plated	0.40	0.45	0.50	...	...	...
Wood Wheel, finished	0.70	0.70	0.75	...	...	...
" " plated	0.75	0.75	0.80	...	...	...
Jenkins' Radiator Valves	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.	1 in.	$1\frac{1}{4}$ in.	$1\frac{1}{2}$ in.	...
Rough Body, plain	2.00	2.50	3.20	4.50	6.25	...
" " with Union	2.75	3.50	4.30	5.85	7.75	...
" " plated Trimmings	2.25	2.70	3.50	4.75	6.50	...
" " with Union	3.00	3.75	4.65	6.25	8.00	...
" " all over	2.50	2.85	3.65	4.90	6.75	...
" " with Union	3.20	3.80	4.75	6.40	8.10	...
Finished Body, plain	2.50	3.00	3.75	5.25	7.25	...
" " with Union	3.20	4.00	4.80	6.40	8.75	...
" " plated all over	2.85	3.10	4.00	5.40	7.75	...
" " with Union	3.25	4.25	5.25	7.00	9.25	...
Radiator Angle Valves, with Spindle for Key:						
Rough	1.35	1.60	2.25	3.25	4.50	7.00
Finished	1.85	2.15	2.85	4.00	5.50	8.50
Rough Nickel Plated	1.65	1.95	2.65	3.70	5.00	7.75
Finished " "	2.15	2.50	3.52	4.45	6.00	9.25
Key, extra	0.75	0.75	0.75	1.00	1.00	1.25
With Frink Seat, add to list	0.30	0.35	0.40	0.60	0.85	1.00

All Radiator Valves are tapped Right Hand, both ends, unless otherwise ordered.

AUTOMATIC AIR VALVES, FOR RADIATORS.

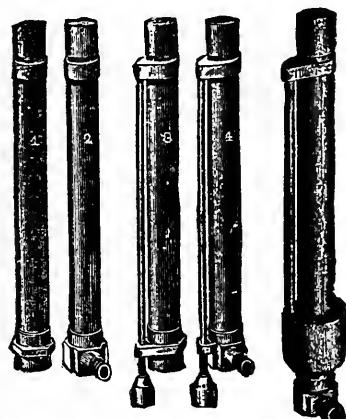


No. 1.

No. 2.

No. 3.

Breckenridge's Patent Air Valves.



No. 1. No. 2. No. 3. No. 4. No. 5.

Davis' Automatic Air Valves.

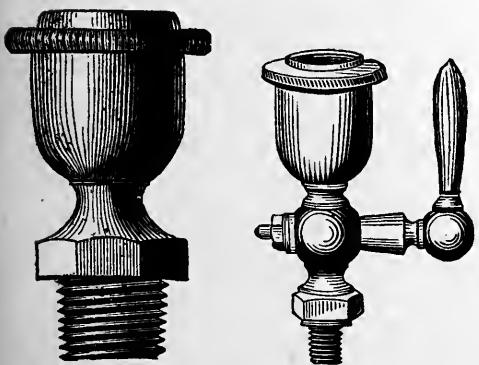
BRECKENRIDGE'S AUTOMATIC AIR VALVES.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$
No. 1. Plain, Iron .....	.....	.....	1.00
" 2. Elbow, Drip on Side .....	.....	.....	1.25
" 3. Brass Elbow and Drip, Nickel Plated.....	1.30	1.30	.....

DAVIS' AUTOMATIC AIR VALVES.

Sizes.	Nos. 1 and 2.	Nos. 3 and 4, with Drain Pipe.	No. 5, with Evaporating Cup.
Price, Finished each	1.15	1.25	1.50
" Plated "	1.25	1.50	1.75

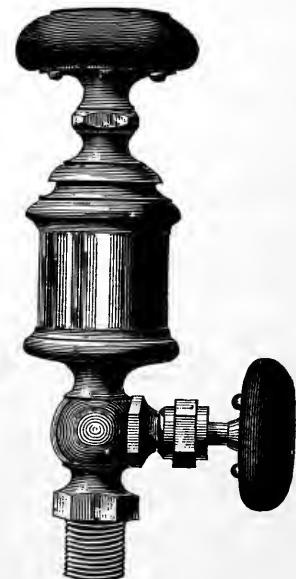
OIL CUPS AND LUBRICATORS.



Plain Oil Cup.

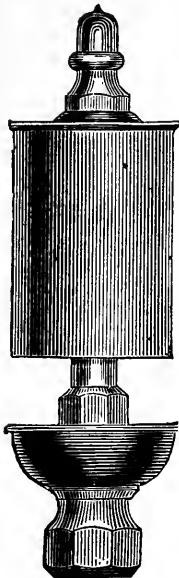
Oil Cup, with Single Cock.

Oil Cup, with Double Cock and Globe.

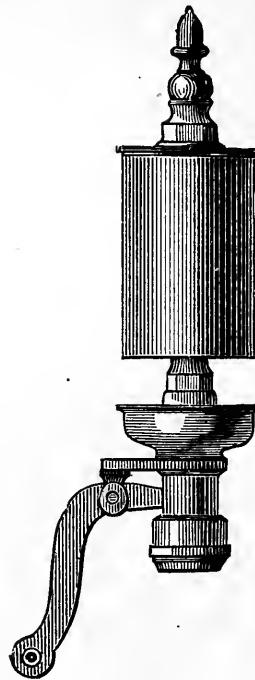


Common Lubricator.

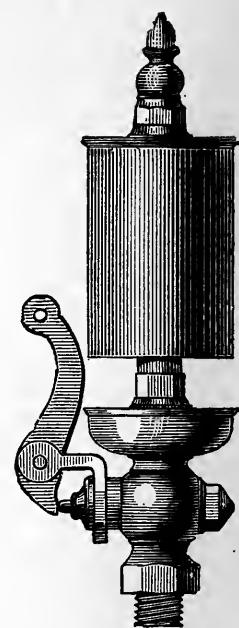
Numbers.....	00	0	1	2	3	4	5	6	7	8	9	10
Plain Oil Cup.....	.25	.30	.35	.40	.50	.60	.90	1.25	1.75	2.25	3.50	....
With Single Cock.....	....	....	1.35	1.60	2.75	3.25	4.00	....	....	....	....	....
Double Cock and Globe.....	3.00	3.75	4.50	5.50	6.50	9.00	15.00	....	....	....	....	....
Lubricators .....	....	....	2.00	2.20	2.30	2.40	2.60	2.90	3.10	3.25	3.75	4.75



No. 1, Steam Whistle,
No Valve.



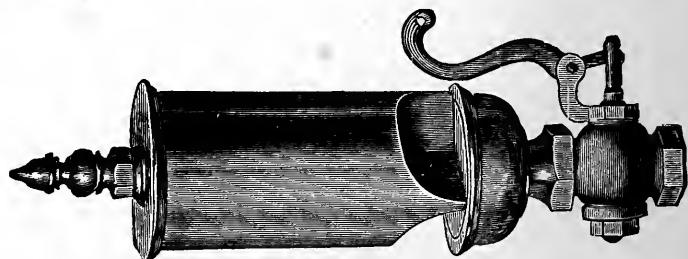
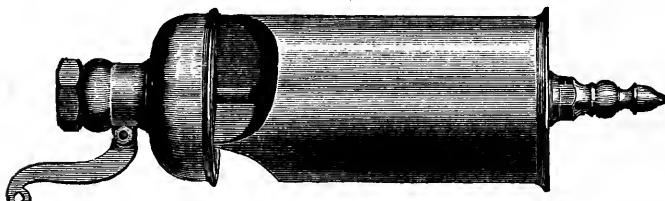
No. 2. Steam Whistle,
Upright Valve, Down Lever.



No. 3. Steam Whistle,
Side Valve, Up Lever.

STEAM WHISTLES.

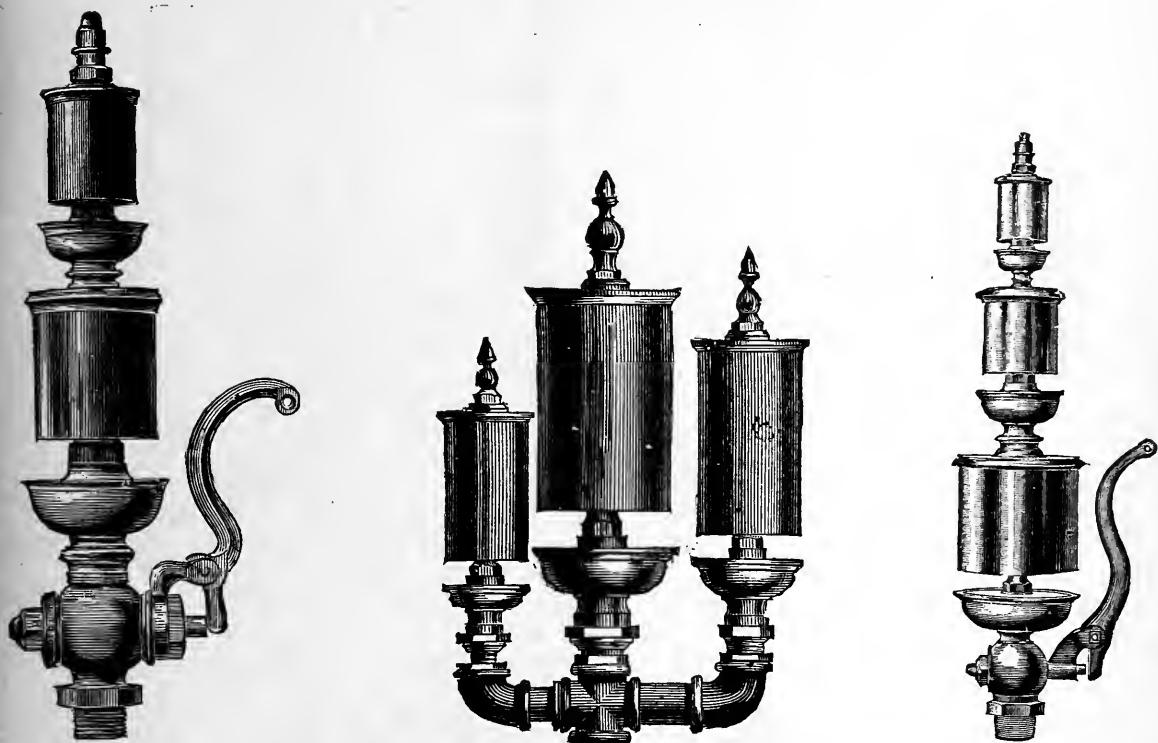
Diameter of Bell.....Inch.	1	1½	2	2½	3	3½	4	5	6	8	10	12
Screwed for Pipe.....Inch.	½	½	½	¾	1	1	1¼	1½	2	2½	2½	3
No. 1, no Valve.....Each.	1.70	2.50	3.25	4.50	6.00	8.50	11.00	18.00	24.00	65.00	125.00	250.00
“ 2, Drop Lever and Valve.. “	....	4.00	4.75	0.50	8.00	11.00	14.00	22.00	30.00	80.00	175.00	350.00
“ 3, Up Lever and Valve ... “	....	4.60	5.50	7.00	9.00	12.50	15.00	23.00	33.00	80.00	175.00	350.00
Nason's Heavy Pattern.. ....	....	....	6.00	...	10.00	....	15.00	25.00	35.00	....	....	....



SINGLE BELL CHIME WHISTLES.

Diameter of Bell.....Inch.	2	3	4	5	6	8	10	12
Size of Steam Pipe.....Inch.	½	¾	1	1¼	1½	2	2½	3
Without Valve.....Each.	5.00	8.00	14.00	22.00	30.00	70.00	110.00	150.00
With Upright Valve..... “	6.50	9.50	16.00	25.00	35.00	85.00	130.00	180.00
“ Side Valve..... “	7.00	11.00	18.00	28.00	38.00	90.00	140.00	200.00

WHISTLE CHIMES.



Three or more Whistles of any Size, to order.

PATENT CHIME STEAM WHISTLES.

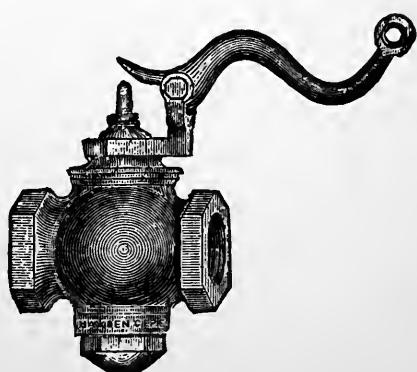
Numbers.....	1	2	3	4
Number of Bells.....	²	³	³	²
Diameter of Bells.....	2 and 3 in.	2, 3 and 4 in.	2, 3 and 5 in.	4 and 6 in.
Size of Pipe Connection.....	1 in.	1 $\frac{1}{4}$ in.	1 $\frac{1}{4}$ in.	1 $\frac{1}{2}$ in.
Price.....	12.50	22.50	29.00	36.00

Numbers.....	5	6	7	8
Number of Bells.....	³	³	²	³
Diameter of Bells.....	2, 4 and 6 in.	3, 5 and 8 in.	6 and 8 in.	3, 5 and 8 in.
Size of Pipe Connection.....	1 $\frac{1}{2}$ in.	3 in.	2 in.	2 $\frac{1}{2}$ in.
Price.....	40.00	*80.00	85.00	90.00

*No Valve.

WHISTLE VALVES.

Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Each.....	2.25	2.75	3.25	4.00	5.50	9.50	20.00	30.00



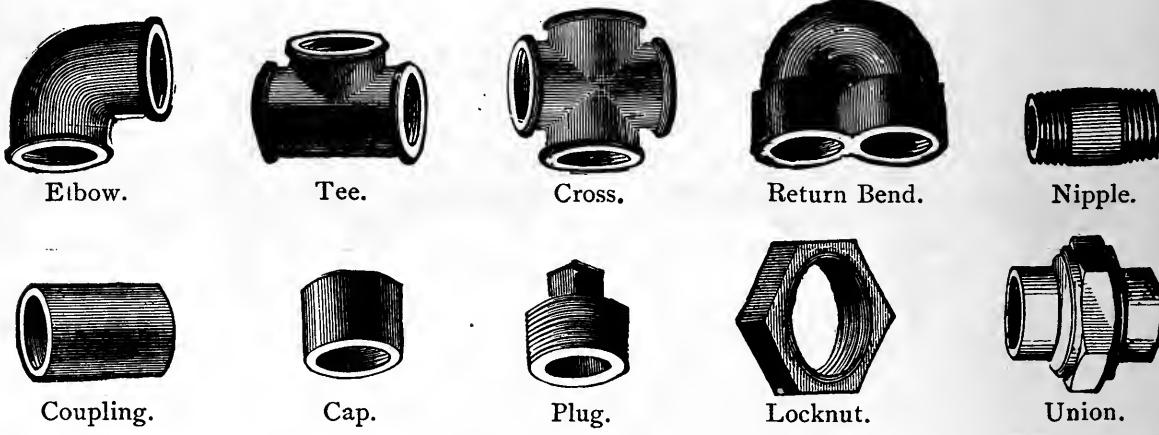
BRASS PIPE, WROUGHT IRON PIPE SIZES.



Outside Diameter.....inches.	$\frac{3}{8}$	$\frac{9}{16}$	$\frac{11}{16}$	$\frac{13}{16}$	$1\frac{1}{16}$	$1\frac{5}{16}$	$1\frac{9}{16}$	$1\frac{13}{16}$	$2\frac{5}{16}$	$2\frac{13}{16}$	$3\frac{1}{2}$
Same size as Iron Pipe.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Length, feet.....	17	17	17	11	11	11	11	11	11	10	10
Weight, per foot, lbs., oz.....	-4	-7	-10	-12 $\frac{1}{2}$	1-4	1-11	2-8	2-12	3-8	4-12	....

Price per pound, lowest current rate at time of purchase.
Iron Fittings will fit Seamless Drawn Brass Tubing.

BRASS FITTINGS, FOR WROUGHT IRON OR BRASS PIPE.



Size.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Elbows.....	.10	.12	.16	.25	.35	.50	.85	1.15	2.00	3.00	4.25
Tees.....	.15	.18	.24	.38	.50	.75	1.25	1.75	3.00	4.50	6.50
Crosses.....	.20	.25	.32	.50	.70	1.00	1.70	2.30	4.00	6.00	8.50
Return Bends, close.....	...	...	...	.40	.60	.90	1.50	2.00	3.00	6.00	9.00
“ “ open.....	...	...	...	.50	.70	1.05	1.75	2.25	3.50	7.50	11.00
Nipples.....	.20	.20	.25	.30	.35	.45	.60	.80	1.10	1.65	2.75
Couplings.....	.08	.10	.15	.20	.30	.35	.60	.75	1.25	1.75	3.00
Locknuts.....	...	.08	.10	.12	.15	.20	.30	.45	.70	1.00	2.00
Unions.....	.35	.40	.55	.75	1.00	1.40	1.90	2.75	4.00	6.00	8.50
Plugs and Caps.....	.06	.08	.10	.15	.20	.30	.50	.70	.90	1.50	2.25

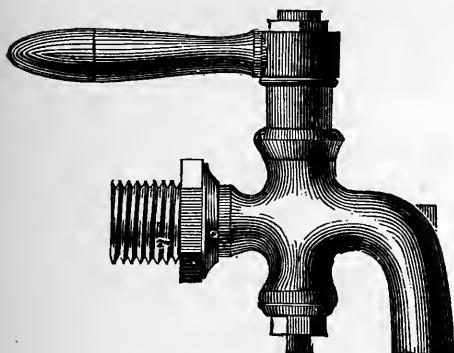


BRASS BUSHINGS—Per Dozen.

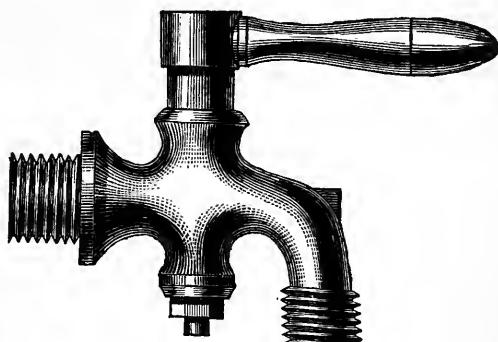


Size.	Price.	Size.	Price.	Size.	Price.	Size.	Price.
$\frac{1}{8} \times \frac{1}{4}$.....	.75	$\frac{3}{8} \times \frac{1}{2}$	1.50	$\frac{3}{4} \times 1\frac{1}{4}$	6.00	$1\frac{1}{4} \times 2\frac{1}{2}$	18.00
$\frac{1}{8} \times \frac{3}{8}$	1.00	$\frac{3}{8} \times \frac{3}{4}$	2.50	$\frac{3}{4} \times 1\frac{1}{2}$	8.00	$1\frac{1}{2} \times 2$	10.00
$\frac{1}{8} \times \frac{1}{2}$	1.50	$\frac{3}{8} \times 1$	4.50	$\frac{3}{4} \times 2$	10.00	$1\frac{1}{2} \times 2\frac{1}{2}$	18.00
$\frac{1}{8} \times \frac{3}{4}$	2.50	$\frac{1}{2} \times \frac{3}{4}$	2.50	$1 \times 1\frac{1}{4}$	6.00	$1\frac{1}{2} \times 3$	30.00
$\frac{1}{4} \times \frac{3}{8}$	1.00	$\frac{1}{2} \times 1$	4.50	$1 \times 1\frac{1}{2}$	8.00	$2 \times 2\frac{1}{2}$	18.00
$\frac{1}{4} \times \frac{1}{2}$	1.50	$\frac{1}{2} \times 1\frac{1}{4}$	6.00	1×2	10.00	2×3	30.00
$\frac{1}{4} \times \frac{3}{4}$	2.50	$\frac{1}{2} \times 1\frac{1}{2}$	8.00	$1\frac{1}{4} \times 1\frac{1}{2}$	8.00	$2\frac{1}{2} \times 3$	30.00
$\frac{1}{4} \times 1$	4.50	$\frac{3}{4} \times 1$	4.50	$1\frac{1}{4} \times 2$	10.00		

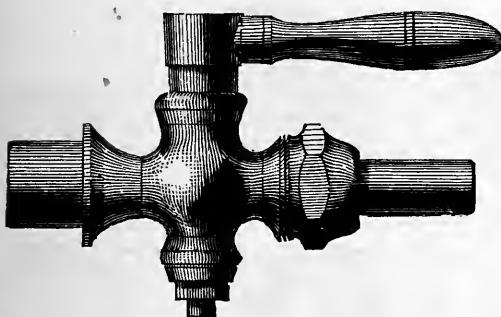
STEAM BIBBS AND STOPS.



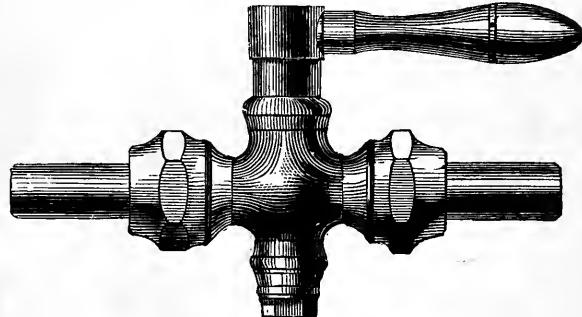
Steam Bibb for Iron Pipe.



Steam Bibb, Hose Nozzle.



Steam Stops, Single Coupling.



Steam Stops, Double Coupling.

STEAM BIBBS, SCREWED FOR IRON PIPE.

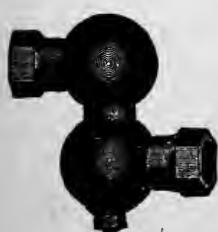
Size.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
Finished.....	1.25	1.50	2.00	2.25	3.00	4.50
Rough.....	1.00	1.25	1.50	1.75	2.50	3.50
With Coupling, Finished.....	1.50	1.75	2.50	2.75	3.50	5.50
" " Rough.....	1.25	1.50	2.00	2.25	3.00	4.50

STEAM STOPS.

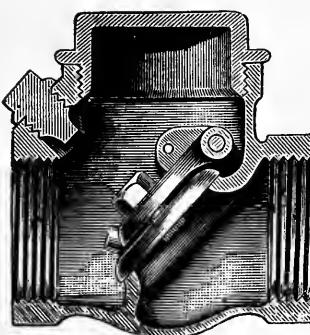
Size.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
Single Coupling, Finished.....	1.75	2.00	2.50	3.00	3.75	6.00
" " Rough.....	1.50	1.75	2.00	2.50	3.25	5.00
Double " " Finished.....	2.00	2.25	3.00	3.50	4.25	7.00
" " Rough.....	1.75	2.00	2.50	3.00	3.75	6.00

STEAM SWING JOINTS.

Size.	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....	1.25	1.75	2.50	4.00	5.00	7.00	12.00



SWINGING CHECK VALVES.



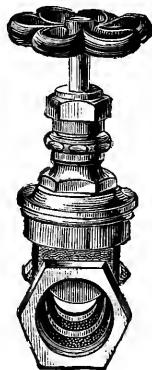
Improved Pattern.



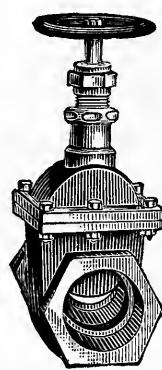
Van Wies Patent.

Size.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Improved Pattern Brass, screwed.....	1.30	1.75	2.25	3.25	4.25	6.25	11.50	16.00	.....
" Iron Body, screwed. ....	.....	.....	3.25	4.25	6.25	10.00	12.00	.....
Van Wies Patent, Brass, screwed....	1.30	1.75	2.25	3.25	4.25	6.25	11.50	16.00	.....
" Iron Body, screwed.....	.....	.....	3.25	4.25	6.25	10.00	12.00	18.00	
" " flanged.....	.....	.....	.....	.....	.....	10.00	12.00	18.00	

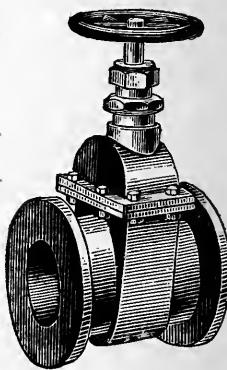
THE "HAYDENVILLE" DOUBLE GATE VALVES.



Brass Valve, Screwed Ends.



Iron Body Valve, Screwed Ends.



Iron Body Valve, Flanged Ends.

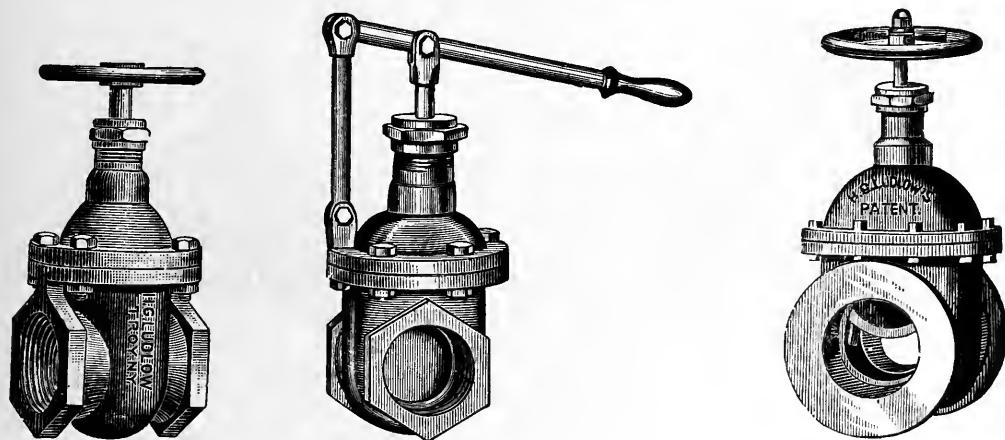
BRASS.

Sizes.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Screwed Ends	1.10	1.10	1.20	1.30	1.75	2.25	3.25	4.25	6.25	11.50	16.00
Flanged " .. ..	.....	.....	2.50	3.00	4.00	5.00	7.50	10.00	16.00	20.00	
Sliding Stem and Lever.....extra	1.00	1.00	1.00	1.00	1.20	1.40	1.60	1.80	2.00	2.25	2.50

IRON BODY, BRASS MOUNTED.

Sizes.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	6
Screwed Ends.....	2.60	3.00	3.50	4.00	5.00	7.00	10.00	12.00	18.00	.....
Flanged "	2.80	3.25	4.00	4.50	5.50	7.00	10.00	12.00	18.00	31.00
Hub or Spigot Ends.....	.....	.....	.....	.....	.....	10.00	.....	15.00	19.00	31.00

LUDLOW SLIDING STOP VALVES.

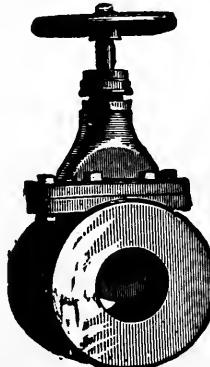


Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	6
Brass, Screwed.....	1.25	1.65	2.15	3.15	4.25	6.25	11.50	16.00	21.00	35.00	78.00
" Flanged,.....	.....	.....	.....	.....	.....	11.50	18.00	22.00	31.00	43.00	90.00
Iron Body, Brass Mounted—											
" Single Gate, Screwed.....	.....	.....	.....	5.50	6.25	9.30	11.50	15.25	16.75	28.50	
" " " Flanged.....	.....	.....	.....	5.75	6.50	9.50	12.00	15.75	17.25	28.00	
" Double " Screwed.....	.....	.....	.....	6.00	7.00	10.50	13.00	16.50	18.00	31.00	
" " " Flanged.....	.....	.....	.....	6.25	7.25	10.75	13.50	17.00	18.50	30.00	
Slide Stem and Lever...extra	1.00	1.00	1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.25	1.25

PEET SLIDING GATE VALVES.



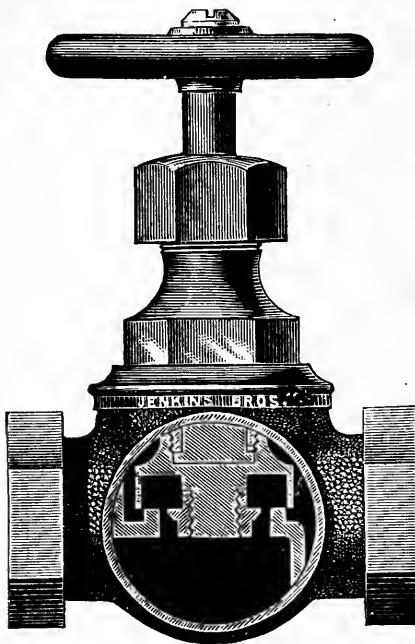
Brass.



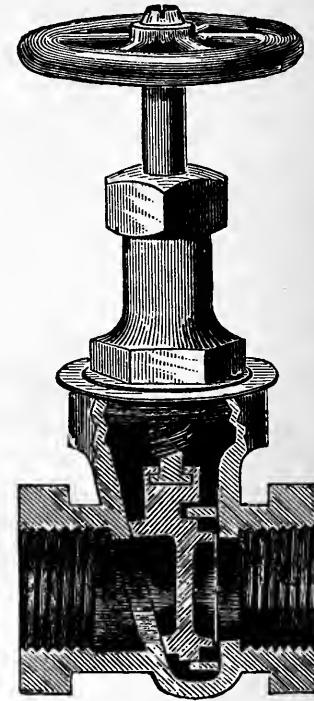
Iron.

Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Brass, Screwed.....	1.00	1.00	1.20	1.75	2.50	3.50	5.00	7.50	14.00	19.50
" Flanged.....	.....	.....	.....	.....	.....	.....	.....	15.00	25.00	30.00
" Quick Opening.....	.....	.....	.....	4.00	5.00	7.00	10.00	19.00	25.00	
Size..	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	7	8	10	12
Iron Body, Brass Mounted—										
" Screwed	12.00	15.00	18.00	20.00	25.00	30.00	43.00	53.00	70.00	95.00
" Flanged.....	12.00	15.00	18.00	20.00	25.00	30.00	43.00	53.00	70.00	95.00
" Quick Opening	16.00	20.00	22.00	25.00	30.00	35.00	48.00	58.00	75.00	110.00

JENKINS' PATENT VALVES.



Globe Valve.



Straightway, or Gate Valve.

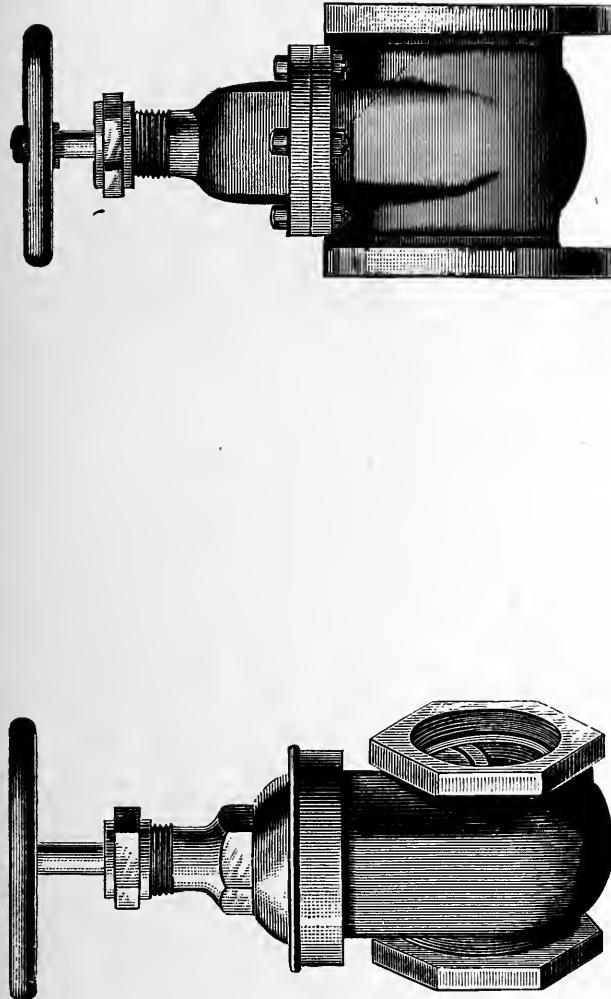
BRASS VALVES.

Size.....	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Straightway, or Gate Valves.....			1.50	2.00	2.85	4.00	5.00	7.50	14.00	20.00
Globe and Angle Valves.....	1.10	1.25	1.60	2 20	2.80	4.00	5.50	8.00	15.75	22.00
Check Valves.....	1.10	1.20	1.30	1.90	2.60	3.60	5.00	7.50	13.50	20.50
Extra Discs.....	.06	.07	.09	.10	.12	.18	.25	.36	.48	.60

IRON BODY, BRASS MOUNTED VALVES.

Size.....	2	2 1/2	3	3 1/2	4	5	6	7	8
Gate Valves, Screwed.....	8.00	12.00	15.00	18.00	21.00	30.00	36.00	50.00	62.00
“ “ Flanged.....	9.00	13.00	16.00	19.00	22.50	32.00	38.00	50.00	62.00
Globe and Angle, Screwed.....	10.00	12.00	16.75	19.50	24.00	40.00	48.00	80.00	90.00
“ “ Flanged.....	11.75	14.00	18.50	21.50	26.00	42.00	50.00	80.00	90.00
Check Valves, Screwed.....		10.50	14.00	17.00	20.00	30.00	40.00	.....	.....
“ “ Flanged.....		12.50	16.50	20.00	23.00	33.00	43.00	.....	.....

KENNEDY'S DOUBLE GATE VALVES.



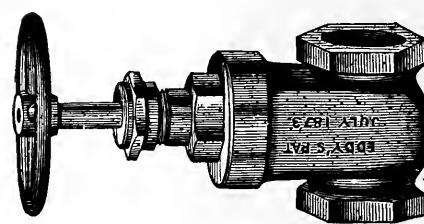
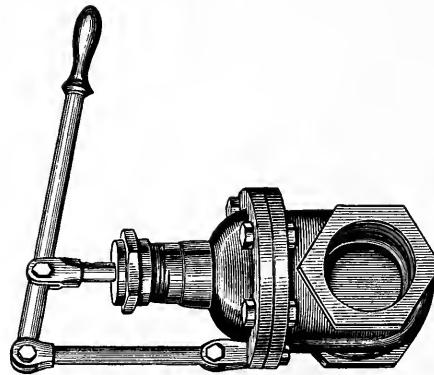
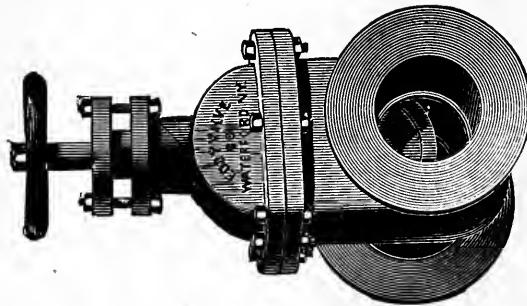
Iron Body Valve, Flanged Ends.

Brass Valve. Screwed Ends.

Brass, Size.....	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price, Screwed.....	1.20	1.75	2.50	3.50	5.00	7.50	15.00	22.00
“ Flanged.....	.....	.....	.....	.....	.....	12.00	22.00	26.00

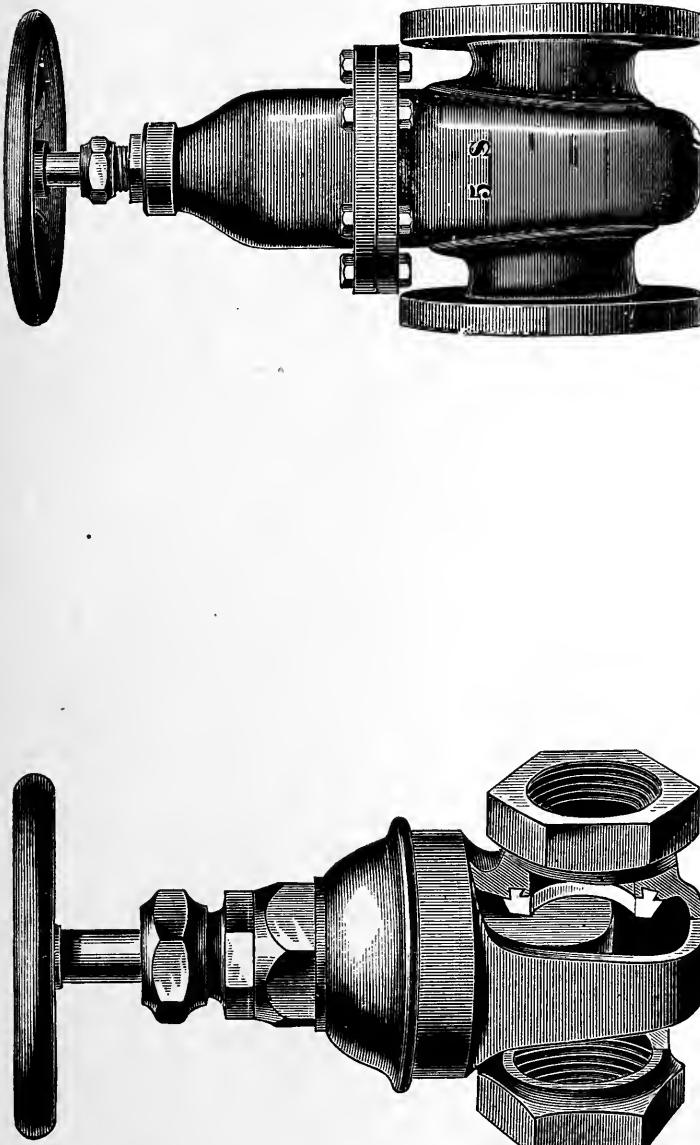
IRON BODY: BRASS MOUNTED.

EDDY GATE VALVES.
ALL DOUBLE GATE.



Size.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	6
Brass Valves, Screwed	1.30	1.70	2.20	3.20	4.20	6.20	11.50	16.00	35.00	80.00
“ Flanged.....	....	....	....	....	....	9.00	15.00	20.00	42.00	90.00
“ Sliding Stem and Lever Extra.....	....	1.00	1.00	1.00	1.00	1.30	1.30	1.30	2.00	6.00
IRON BODY, BRASS MOUNTED.										
Size.	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	8	10	
Screwed.....	7.00	10.50	13.00	16.50	18.00	25.00	31.00	45.00	45.00	....
Flanged.....	7.00	10.50	13.00	16.50	18.00	25.00	31.00	45.00	45.00	60.00
Lever Valves Extra.....	1.20	1.30	1.40	1.50	1.70	2.00	2.30	3.00	3.00	3.50

CHAPMAN'S PATENT GATE VALVES.

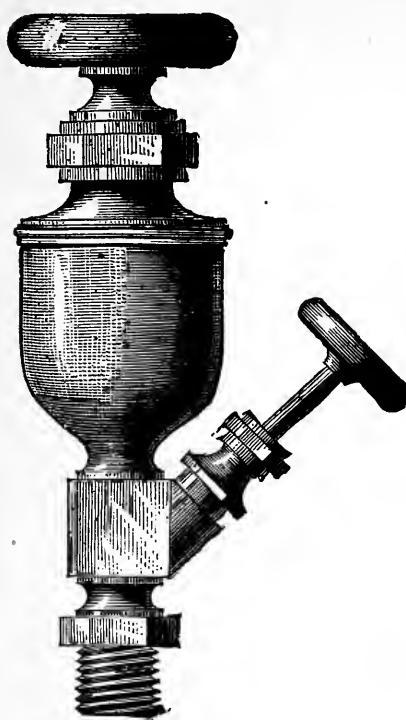


BRASS VALVES.

Size.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Screwed	1.30	1.75	2.25	3.25	4.25	6.25	11.50	16.00	40.00
Flanged.....	2.50	3.00	4.00	5.00	7.50	10.00	16.00	20.00	48.00
Sliding Stem and Lever extra.....	1.00	1.20	1.40	1.60	1.80	2.00	2.25	2.50	3.00

IRON BODY, BRASS MOUNTED.

Size.	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6	8
Screwed Ends.....	3.00	4.00	5.00	7.00	10.00	13.00	19.00	25.00	32.00	48.00
Flanged Ends.....	3.50	4.50	5.50	7.00	10.00	13.00	19.00	25.00	32.00	48.00
Sliding Stem and Lever Extra.....	1.40		1.80	2.00	2.25	2.50	3.00	....	....	....

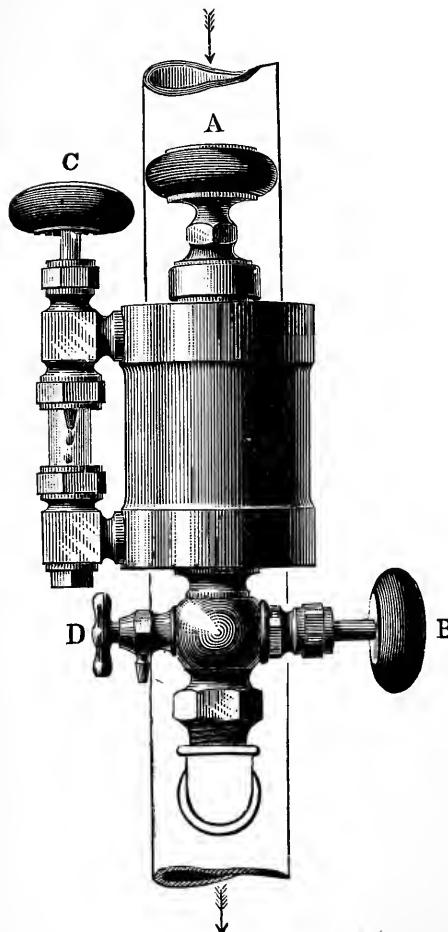


BENTON'S
PATENT LUBRICATOR.

Diameter of Bowl, inches.....	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Price, each.....	2.25	2.75	3.75	5.00	7.00

Threaded for Iron Pipe..... $\frac{3}{8}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{3}{4}$

“HANDY” DROP-FEED LUBRICATOR.



FOR STATIONARY AND PORTABLE ENGINES
OF ALL KINDS, STEAM PUMPS, Etc.

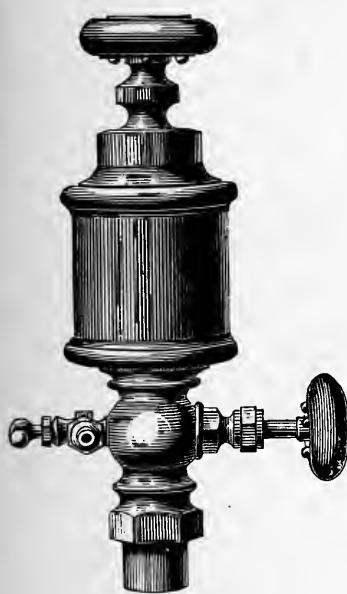
A Filling Plug. C Regulating Valve.

B Steam Valve. D Waste Cock.

Sizes.	$\frac{1}{8}$ Pint.	$\frac{1}{2}$ Pint.	$\frac{3}{4}$ Pint.	1 Pint.	1 $\frac{1}{2}$ P'ts.	1 Quart.
Brass Finish...	10.00	12.00	14.00	16.00	20.00	24.00

Nickle Plating Extra.

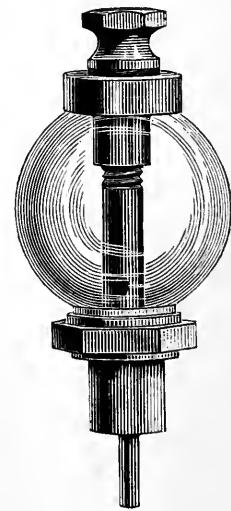
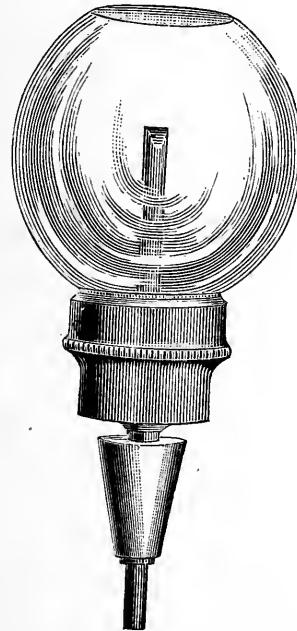
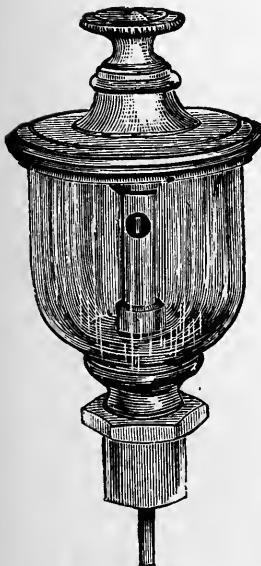
NATHAN'S PATENT SELF-ACTING LUBRICATORS.



FOR STEAM CHESTS AND CYLINDERS OF ALL
KINDS AND SIZES.

Size, Inches.....	1	1½	2	2½	3	3½	4	5	6	7
Capacity, Pints.....	1/8	1/6	1/3	1/2	3/4	1	2	3	5	7
Plain Patent, Each...	3.00	4.50	6.00	8.00	10.00	13.00	16.00	.....	.....	.....
With Yoke.....	.....	.....	.....	.....	16.00	20.00	24.00	33.00	42.00	54.00

DREYFUS' PATENT SELF OILERS.



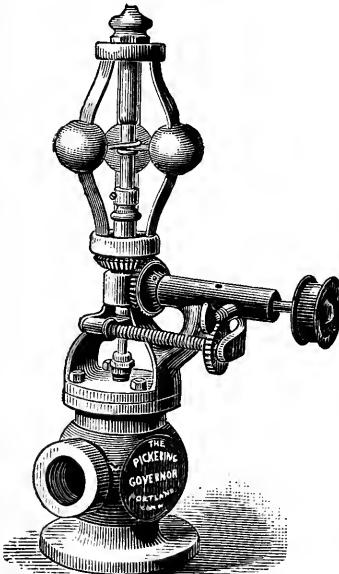
No.	Capacity.	Diameter.	Height.	Price per Dozen.	No.	Capacity.	Diameter.	Height.	Price per Dozen.
000	3/4 ozs.	1 1/2 ins.	2 1/8 ins.	5.00	13 W. B.	1 1/2 ozs.	1 3/4 ins.	3 1/2 ins	7.50
00	3/4 "	1 7/8 "	2 1/2 "	4.50	14	3 1/2 "	2 5/8 "	4 "	7.50
0	1 "	2 1/4 "	2 1/2 "	5.00	15	3 1/2 "	2 5/8 "	4 "	10.50
3	3/4 "	1 7/8 "	2 1/8 "	4.50	16	3/8 "	1 3/8 "	2 "	7.00
9	1 1/2 "	2 1/2 "	3 1/4 "	4.50	18	3 1/2 "	2 5/8 "	4 1/2 "	18.00
9 W. B.	1 1/2 "	1 3/4 "	3 1/4 "	4.50	22	3/4 "	1 1/2 "	2 5/8 "	9.00
10	3 1/2 "	2 1/4 "	4 1/4 "	4.50	23	1/8 "	1 1/4 "	1 5/8 "	9.00
10 W. B.	3 "	2 "	4 1/4 "	4.50	24	2 1/4 "	2 1/4 "	3 5/8 "	10.50
II	1 1/2 "	2 1/2 "	3 1/4 "	7.00	25	8 "	3 "	6 "	18.00
12	3 1/2 "	2 1/4 "	4 1/4 "	7.00	26	3/4 "	1 3/4 "	2 3/4 "	9.00
13	1 1/2 "	2 1/2 "	3 1/4 "	7.50					

ENGINE CUPS—Skeleton.

Number.	Capacity.	Diameter.	Height.	Price per Dozen.
30	$\frac{1}{4}$ ounces.	$1\frac{3}{4}$ inches.	$2\frac{1}{2}$ inches.	\$18.00
46	1 " "	$2\frac{1}{4}$ "	$3\frac{1}{2}$ "	27.00
48	$1\frac{1}{4}$ " "	$2\frac{3}{8}$ "	$3\frac{3}{4}$ "	27.00
54	1 " "	$2\frac{1}{4}$ "	$3\frac{3}{8}$ "	27.00
60	$1\frac{1}{4}$ " "	$2\frac{1}{2}$ "	$3\frac{3}{4}$ "	33.00
72	2 " "	$2\frac{3}{4}$ "	$4\frac{1}{2}$ "	39.00
76	$4\frac{1}{2}$ " "	$3\frac{3}{8}$ "	$5\frac{1}{2}$ "	48.00
80	8 " "	$3\frac{3}{4}$ "	$5\frac{1}{2}$ "	66.00
90	$1\frac{1}{4}$ " "	5 "	$7\frac{1}{4}$ "	90.00
32	8 " "	$4\frac{1}{2}$ "	6 "	21.00
A,	$\frac{3}{8}$ ounces.	$1\frac{5}{8}$ inches.	$2\frac{1}{2}$ inches.	8.00
B, Small	$\frac{3}{4}$ " "	2 "	3 "	10.00
B,	$1\frac{1}{8}$ " "	$2\frac{1}{8}$ "	$3\frac{1}{2}$ "	12.00
C,	3 " "	$2\frac{7}{8}$ "	$4\frac{1}{2}$ "	16.00
D,	8 " "	$3\frac{1}{2}$ "	$5\frac{1}{4}$ "	20.00

ENGINE CUPS—Shell Cased.

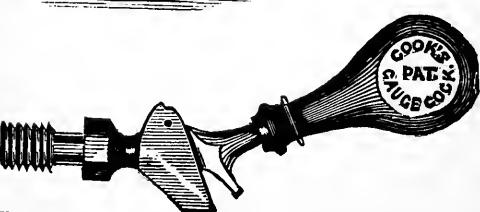
No	Capacity.	Diameter.	Height.	Price
20	$\frac{1}{16}$ ounces.	1 inches.	$1\frac{1}{2}$ inches.	12.00
21	$\frac{1}{8}$ " "	$1\frac{3}{8}$ "	$2\frac{1}{4}$ "	18.00
28	$\frac{1}{4}$ " "	$1\frac{1}{2}$ "	$2\frac{1}{2}$ "	27.00
36	1 " "	2 "	$3\frac{1}{2}$ "	36.00
42	$1\frac{1}{4}$ " "	2 "	4 "	36.00
60	$2\frac{1}{2}$ " "	$2\frac{3}{8}$ "	$4\frac{1}{4}$ "	48.00
72	$4\frac{1}{2}$ " "	3 "	$4\frac{1}{2}$ "	60.00
100	1 quart.	$5\frac{3}{4}$ "	10 "	180.00



PICKERING GOVERNORS.

Size.	Portable.	Plain.	Finished.	Speeder, Extra.	Stop Motion and Speeder, Extra.
$\frac{1}{2}$ inches.					
$\frac{3}{4}$ "	\$15.00	\$16.00	\$17.00	\$1.50	....
1 "	16.00	18.00	19.00	1.50	....
$1\frac{1}{4}$ "	18.00	20.00	22.00	2.00	\$4.00
$1\frac{1}{2}$ "	20.00	22.00	23.00	2.50	4.00
2 "	23.00	26.00	28.00	2.50	4.50
$2\frac{1}{2}$ "	36.00	41.00	43.00	3.50	7.00
3 "	....	45.00	52.00	4.25	8.00
$3\frac{1}{2}$ "	....	54.00	62.00	4.50	9.00
4 "	....	64.00	73.00	5.00	11.00
$4\frac{1}{2}$ "	....	74.00	84.00	5.50	12.00
5 "	....	84.00	95.00	6.00	14.00
6 "	....	115.00	130.00	7.00	16.00
7 "	....	140.00	155.00	8.00	18.00
8 "	....	170.00	188.00	9.00	20.00
10 "	....	205.00	235.00	12.00	25.00

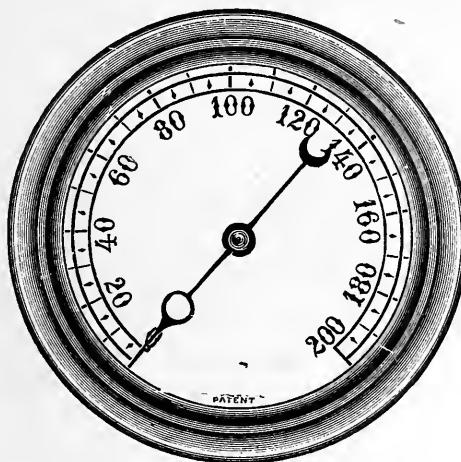
REGESTER'S BALL GAUGE COCKS.



Regester's Ball Gauge Cock.

Size.....	Inch.	$\frac{1}{2}$	$\frac{3}{4}$
Iron.....	Each.	1.00	1.00
Brass.....	"	1.75	1.75

STEAM GAUGES.



ASHCROFT'S STEAM GAUGES.—BOURDON SPRING.

BRASS CASES, LACQUERED.

No. o.	12 inch Dial.....	70.00
" 1.	10 "	40.00
" 2.	8½ "	30.00
" 3.	6¾ "	20.00
" 4.	6 "	16.00
" 5.	5½ "	12.00
" 8.	4½ "	8.00
" 9.	3½ "	8.00

IRON CASES, JAPANNED.

No. 1½.	10 inch Dial.....	30.00
" 2½.	8½ ".....	24.00
" 3½.	6¾ ".....	16.00
" 6.	6 ".....	12.00
" 7.	5½ ".....	8.00
" 8½.	4½ ".....	6.00
" 9½.	3½ ".....	6.00
" 10½.	2 ".....	6.00

BOURDON PRESSURE AND VACUUM GAUGES.

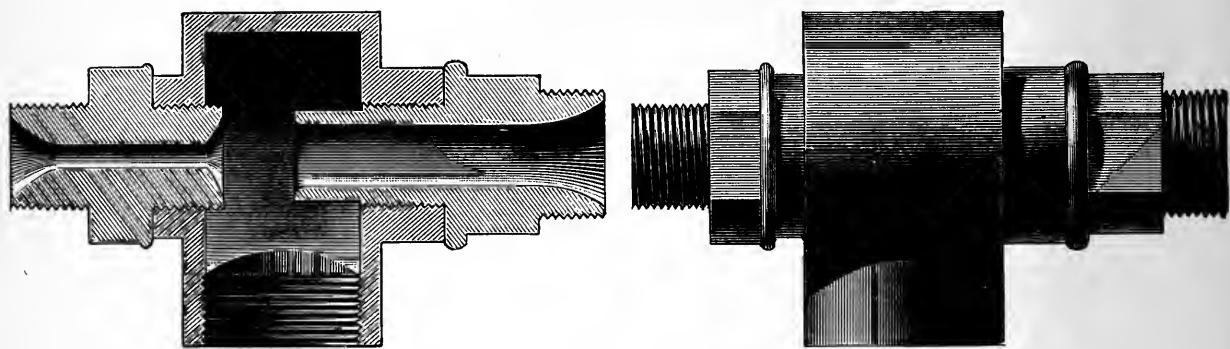
No. o.	Brass Case and Ring, 10 inch Dial	38.00
" 1.	" " 8½ ".....	28.00
" 2.	" " 6¾ ".....	20.00
" 3.	" " 6 ".....	17.00
" 4.	" " 5½ ".....	14.00
" 5.	" " 4½ ".....	12.00
" 6.	" " 3½ ".....	10.00
" 7.	" " 2½ ".....	10.00
1½.	Iron Case, Brass Ring, 8½ "	20.00
2½.	" " 6¾ ".....	16.00
3½.	" " 6 ".....	14.00
4½.	" " 5½ ".....	10.00
5½.	" " 4½ ".....	10.00
6½.	" " 3½ ".....	9.00
" 10.	" Spun Br. " 5 "	6.00

CROSBY'S IMPROVED STEAM GAUGES.

No. o.	Brass Case and Ring, 10 inch Dial.....	40.00
" 1.	" " 8½ ".....	30.00
" 2.	" " 6¾ ".....	22.00
" 3.	" " 6 ".....	19.00
" 4.	" " 5½ ".....	16.00
" 5.	" " 4½ ".....	12.00
1½.	Iron Case, Brass Ring, 8½ "	22.00
2½.	" " 6¾ ".....	18.00
3½.	" " 6 ".....	16.00
4½.	" " 5½ ".....	12.00
5½.	" " 4½ ".....	11.00

NASON'S EJECTORS OR SYPHON PUMPS.

FOR RAISING WATER AND CONVEYING LIQUIDS.



They are very simple in construction, and require only a small quantity of steam to operate them.

They are applicable for raising water and other fluids from Tanks, Wells, Mines, Quarries, Holds of Vessels, Docks, Gas Works, etc.

These Ejectors will force water or liquids as follows :

At 14 lbs. Steam Pressure.	20 Feet in Height.
" 28 "	40 "
" 42 "	60 "
" 56 "	75 "
" 70 "	90 "

CAPACITIES AND PRICES OF EJECTORS.

Number.	1	2	3
Delivery in Gallons per hour at 45 lbs. steam pressure...	900	1,200	2,000
Size of Steam Connections.....	3/4 in.	1 in.	1 1/4 in.
" Suction "	1 1/4 "	1 1/2 "	2 "
" Discharge "	1 "	1 1/4 "	1 1/2 "
Boiler Capacity, Horse Power	3 to 4	5 to 6	7 to 8
Price, Iron.....	7.00	.....	.....
" Brass.....	8.00	15.00	25.00

BILGE PUMPS AND LARGER SIZED EJECTORS
MADE TO ORDER BY CONTRACT.

In ordering Ejectors please give :

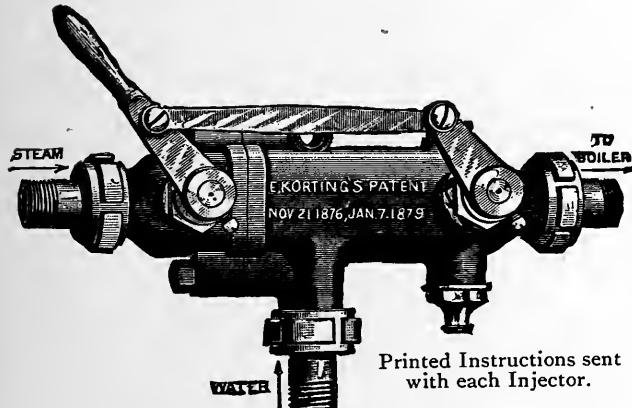
- 1st. *The nature, quantity and temperature of the liquid; also, the depth of suction, and the height to which it has to be raised.*
- 2d. *The pressure and quantity of steam available for needed purposes.*

HANCOCK'S INSPIRATORS, FOR STATIONARY BOILERS.



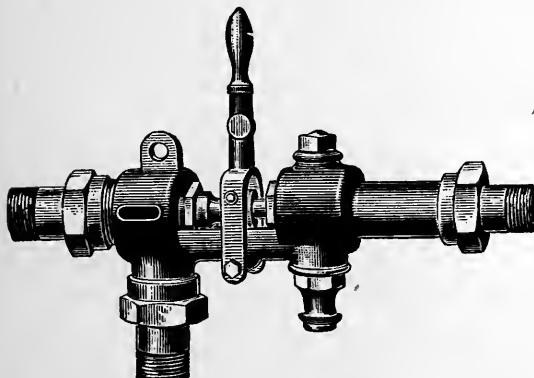
No. of Inspirator.	SIZE OF CONNECTIONS.		Gallons per Hour, 60 lbs. Pressure.	Price.
	Suction and Feed.	Steam.		
No. 7 $\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{8}$	60	16.00
" 8 $\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	85	18.00
" 10	$\frac{1}{2}$	$\frac{3}{8}$	120	20.00
" 12 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	220	25.00
" 15	$\frac{3}{4}$	$\frac{1}{2}$	300	30.00
" 17 $\frac{1}{2}$	1	$\frac{1}{2}$	360	40.00
" 20	1	$\frac{3}{4}$	540	45.00
" 22 $\frac{1}{2}$	$1\frac{1}{4}$	1	700	55.00
" 25	$1\frac{1}{4}$	1	900	60.00
" 30	$1\frac{1}{2}$	$1\frac{1}{4}$	1,260	75.00
" 35	$1\frac{1}{2}$	$1\frac{1}{4}$	1,740	90.00
" 40	2	$1\frac{1}{2}$	2,230	110.00
" 45	2	$1\frac{1}{2}$	2,820	125.00
" 50	$2\frac{1}{2}$	2	3,480	150.00

KORTING'S DOUBLE TUBE INJECTOR.

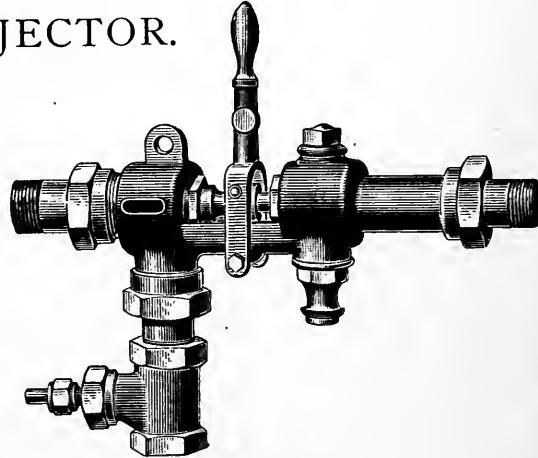


No. of In- jector.	Price of In- jector.	Horse Power.	Gall's per Hour.	Pipe Connec- tion.	Price of Stra'r
No. 1	23.00	1 to 12	100	$1\frac{1}{2}$ in.	2.00
" 2	28.00	20	150	$1\frac{1}{2}$ "	2.00
" 3	38.00	40	300	$3\frac{1}{4}$ "	2.50
" 3 $\frac{1}{2}$	46.00	50	400	$3\frac{1}{4}$ "	2.50
" 4	55.00	70	550	1 "	3.00
" 5	60.00	85	650	$1\frac{1}{4}$ "	4.00
" 6	65.00	120	900	$1\frac{1}{4}$ "	4.00
" 7	85.00	160	1,260	$1\frac{1}{2}$ "	5.00
" 8	100.00	200	1,750	$1\frac{1}{2}$ "	5.00
" 9	120.00	250	2,200	2 "	7.00
" 10	135.00	310	2,800	2 "	7.00
" 12	165.00	475	3,500	$2\frac{1}{2}$ "	10.00

RUE'S LITTLE GIANT INJECTOR.



Non-lifting.



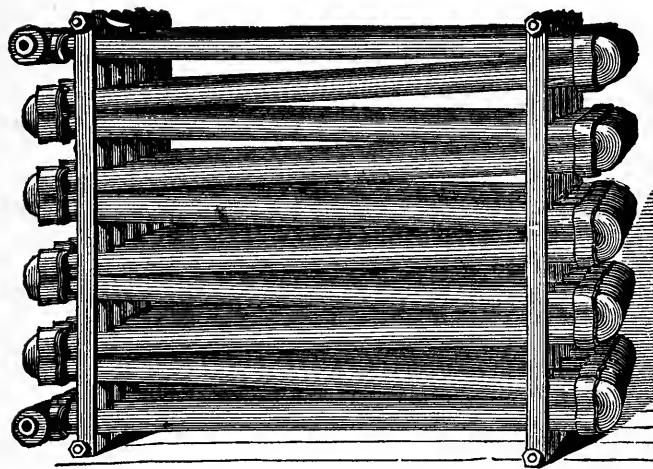
Lifting.

Size of Injector. Number.....	1	2	3	4	5	6	7	8
Horse Power.....	8	16	32	64	96	144	193	244
Capacity per Hour. Gallons	60	120	240	480	720	1,080	1,450	1,830
Size of Iron Pipe	$1\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Price of Non-lifting Injector. Plain.....	15.00	20.00	27.00	40.00	50.00	65.00	75.00	95.00
" Lifting "	.....	.....	29.00	42.00	53.00	69.00	79.00	101.00
Price of Lifter.....	.....	.....	2.00	2.00	3.00	4.00	4.00	6.00

Jet Valve, well finished wood handle, all sizes, \$3.00.

The capacity of Injectors is based upon a steam pressure of 80 pounds; higher or lower steam will increase or diminish the capacity. For very high or very low steam, we make a special Injector.

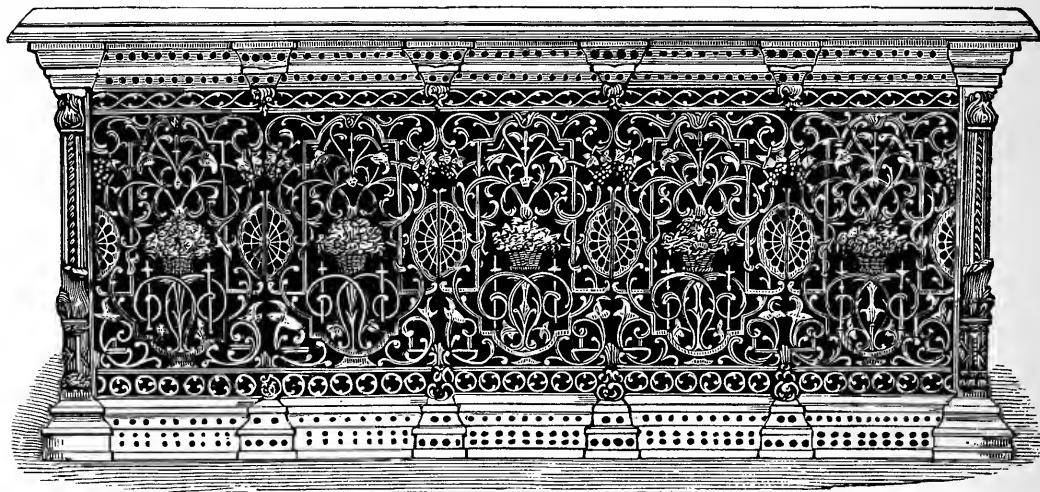
RETURN BEND OR BOX COILS.



WITH MANIFOLDS AND STANDS
READY FOR USE.

Length of Pipes, feet..	3	4	6	8	9	10
3/4 in. Pipe, per foot...	26	22	18	16	16	15
1 " " " ...	34	29	24	22	20	20

ORNAMENTAL SCREENS.



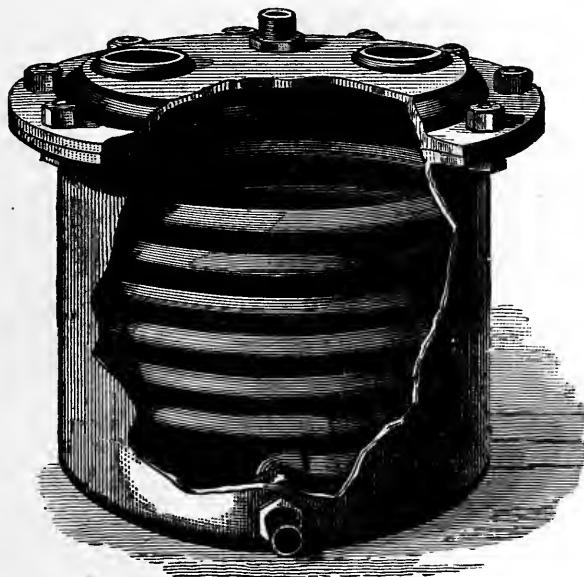
FOR COILS OF STEAM PIPE.

Price per running foot, measured around body of Screens. In ordering, please state whether Screens are wanted with three or four sides.

Numbers.	1	2	3	3	3	3	3	4
Height, Inches.....	31 1/2	32	32	34	36	38	40	36
Gold Bronzed, imitation of Bronze Metal, or Artistic.....	4.10	3.80	4.10	4.60	5.00	5.40	5.80	5.00
Grained, White, or Chocolate, with figures Bronzed in Relief.....	3.65	3.25	3.65	4.10	4.50	4.90	5.30	4.50
Chocolate Tipped with Bronze.....	3.50	3.10	3.50	3.95	4.35	4.75	5.15	4.35
Unfinished Iron	2.75	2.50	2.75	3.20	3.55	3.90	4.25	3.55

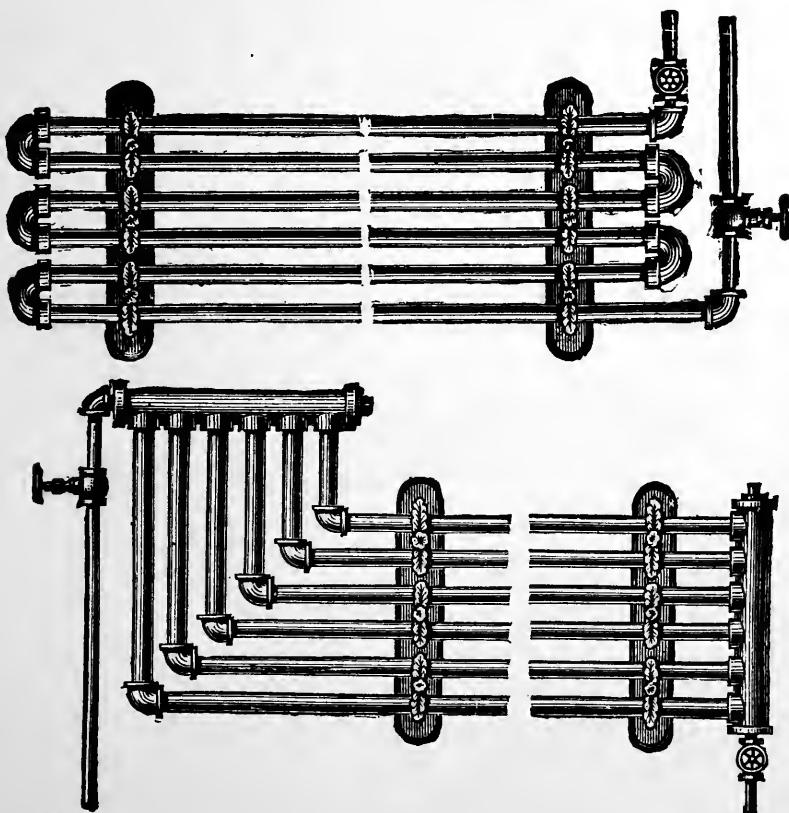
MARBLE TOPS, O G EDGE, per square foot, 1.00 net.

FEED WATER HEATERS, CAST IRON, WITH
WROUGHT IRON COIL.



Size of Pipe	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Diameter of Cylinder. inches	$12\frac{1}{4}$	$14\frac{1}{4}$	$16\frac{3}{4}$	$20\frac{1}{4}$	24
Height of Cylinder.....	12	14	$16\frac{1}{2}$	20	24
Feet of Pipe in Coil	15	17	24	35	46
Price	20.00	30.00	45.00	80.00	130.00

WALL COILS.



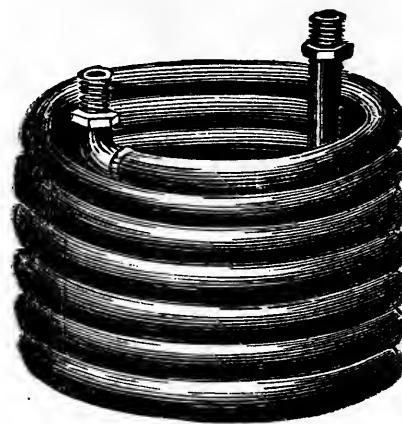
Any Size made to Order. Prices furnished upon Application

SPIRAL COILS, FOR TANKS, Etc.



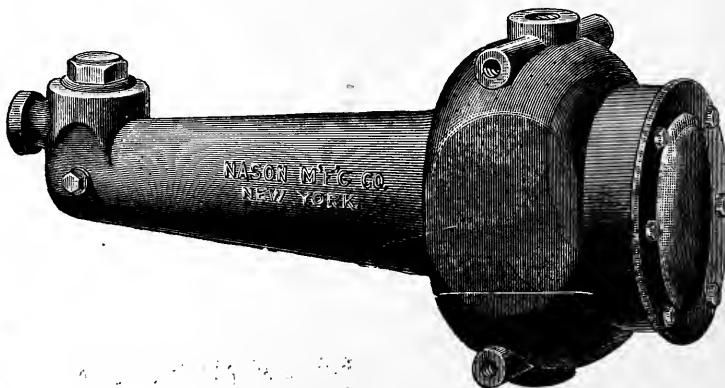
Size of Pipe.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, per Foot.....	40	50	62	84	1.07	1.36

HEATER COILS.



Size of Pipe.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, per Foot.....	36	46	57	76	1.00	1.25

NASON'S "AUTOMATIC WATER" FEEDER.



Outside Length.	24 $\frac{1}{2}$ ins.
Height.....	13 "
Width.....	9 "
Size of Boiler Connection.....	1 "
Size of Gauge Glass Connection.....	$\frac{1}{2}$ "
Size of Feed Water Inlet.....	$\frac{3}{4}$ "
Price	20.00
Price with Water Gauge, including Glass	22.00

DOUBLE OR JACKET STEAM KETTLES.

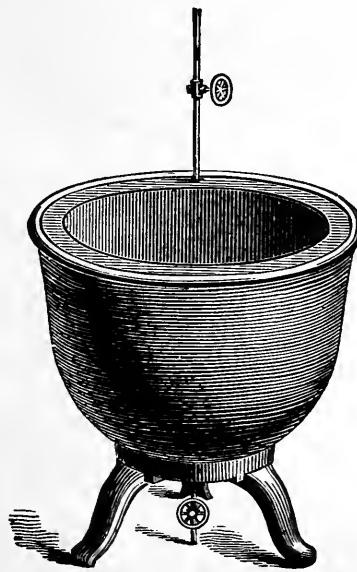
WITH MOVABLE LEGS.

Tested to 50 lbs. Hydraulic Pressure.

Capacity, gals..	5	8	11	15	21	31	54	83	105
Inside Diameter, in.	13 $\frac{7}{8}$	17 $\frac{3}{4}$	19 $\frac{1}{8}$	21 $\frac{3}{4}$	23 $\frac{1}{2}$	27 $\frac{1}{2}$	32 $\frac{3}{4}$	38	42 $\frac{1}{4}$
" Depth, in.	9 $\frac{1}{4}$	10 $\frac{3}{4}$	12 $\frac{1}{4}$	14 $\frac{1}{4}$	16 $\frac{1}{2}$	17 $\frac{1}{2}$	19 $\frac{1}{2}$	22 $\frac{1}{4}$	23 $\frac{1}{4}$
Price, including Legs	15.00	20.00	25.00	30.00	38.00	45.00	70.00	100.00	120.00
" Inside Enameled	20.00	29.00	36.00	43.00	53.00	.....	.....	.....	.....

Steam Kettles furnished with Copper Linings.

SEAMLESS DOUBLE JACKET STEAM KETTLES.

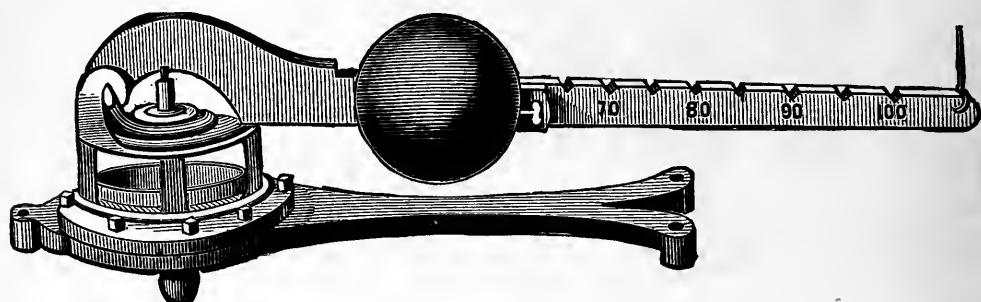


These Kettles are all cast in one piece, having a steam space cored out. They do not require either Bolts or Packing in their construction, and are proved at a steam pressure of 75 pounds. Covers of Black or Galvanized Iron and Planished Copper, also larger sized Kettles, made to order.

VOID SEE REVISED PRICES.

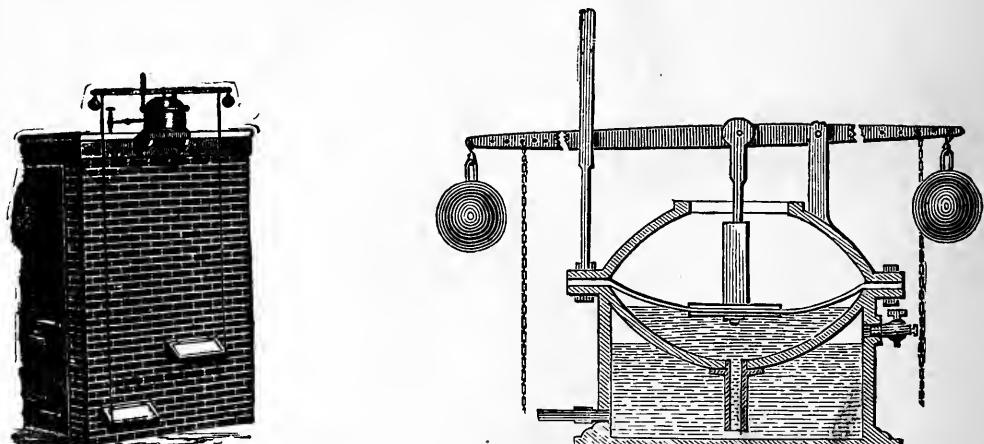
Capacity in gallons.....	1	3	5	10	15	20	25	30
Price, without Cover.....	10.00	15.00	20.00	25.00	30.00	35.00	45.00	55.00
Capacity in gallons.....	40	50	60	75	100	125	150	200
Price, without Cover.....	65.00	75.00	85.00	100.00	125.00	150.00	200.00	250.00

STEAM DAMPERS OR DRAFT REGULATORS.
FOR HIGH PRESSURE.

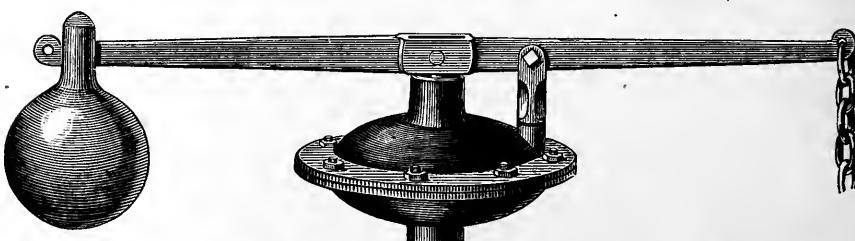


Numbers.	1	2	3
For Boilers, Horse Power and under	5 10.00	20 15.00	30 25.00
Price.....			

DAMPER REGULATORS FOR LOW PRESSURE.



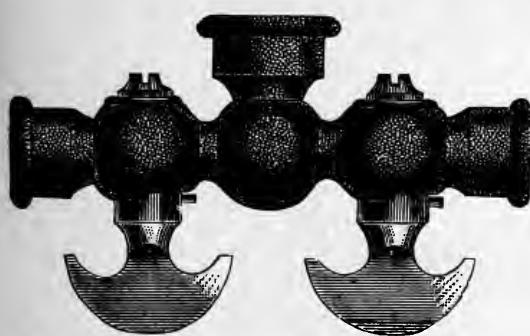
NASON'S LOW PRESSURE REGULATOR, WITH COLD WATER RESERVOIR,
AND WITH INDEPENDENT DOORS.



CHEAP PATTERN LOW PRESSURE DAMPER REGULATOR.

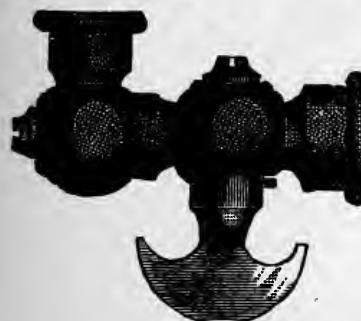
Nason's with Cold Water Reservoir and with Independent Doors.....	15.00
" " " " without Doors.....	12.00
Cheap Pattern, 7 inch plates.....	5.00
" 9 ".....	7.50

BRASS GAS FIXTURE FITTINGS.]



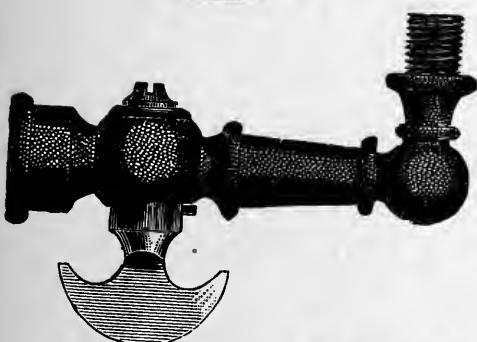
TWO LIGHT PENDANT COCKS.

Size.....	$\frac{1}{4}$ to $\frac{1}{8}$	$\frac{3}{8}$ to $\frac{1}{8}$	$\frac{3}{8}$ to $\frac{1}{4}$	.....
Price, per dozen	8.00	9.70	9.70	.....
Extra Heavy	$\frac{1}{4}$ to $\frac{1}{8}$ 14.20	$\frac{3}{8}$ to $\frac{1}{4}$ 14.20	$\frac{3}{8}$ to $\frac{3}{8}$ 14.20	$\frac{1}{2}$ to $\frac{3}{8}$ 16.50



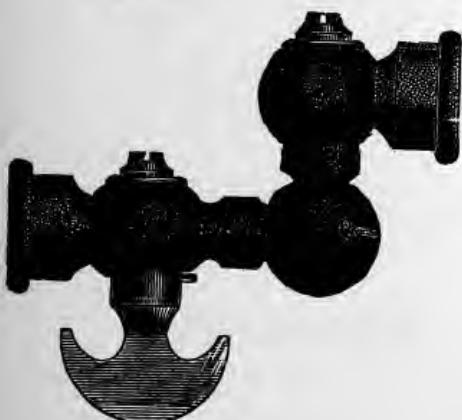
ELBOW PENDANT COCKS.

Size.....	$\frac{1}{4}$ to $\frac{1}{8}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{3}{8}$ to $\frac{1}{8}$	$\frac{3}{8}$ to $\frac{1}{4}$
Price, per dozen.....	4.40	5.30	5.40	5.40
Extra Heavy	$\frac{1}{4}$ to $\frac{1}{8}$ 8.00	$\frac{3}{8}$ to $\frac{1}{8}$ 8.50	$\frac{3}{8}$ to $\frac{1}{4}$ 8.50	$\frac{3}{8}$ to $\frac{3}{8}$ 8.50



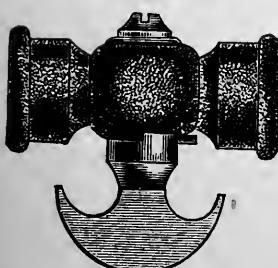
ELBOW BURNER COCKS.

Size.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Price, per dozen.....	4.50	5.25	6.00	7.00
Extra Heavy.....	7.50	8.50	9.00	9.00



BRACKET COCKS.

Size	$\frac{3}{8}$ to $\frac{1}{8}$	$\frac{3}{8}$ to $\frac{1}{4}$	$\frac{3}{8}$ to $\frac{3}{8}$
Price, per dozen.....	7.50	8.00	9.50
“ Universal.....	12.00	12.00	13.50
Extra Heavy	11.50	11.50	12.00

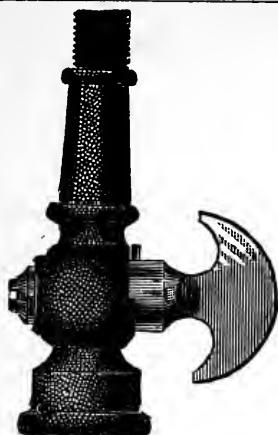


STRAIGHT COCKS.

Size.....	$\frac{1}{8}$	$\frac{1}{4}$ to $\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$ to $\frac{1}{4}$	$\frac{3}{8}$
Price, per dozen	3.50	4.40	4.50	5.00	5.40
Extra Heavy	$\frac{3}{8}$ to $\frac{3}{8}$ 7.90	$\frac{1}{2}$ to $\frac{1}{2}$ 8.30	...	...	...

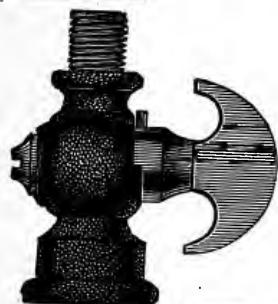
BRASS GAS FIXTURE FITTINGS— Continued.

PILLAR COCKS.



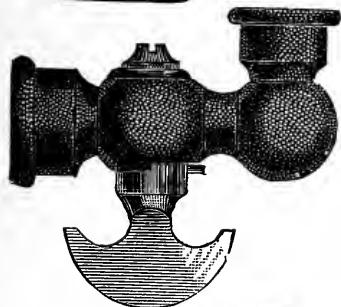
	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price, per doz.....	3.25	4.00	5.25	6.50	7.50
Extra Heavy .....	.....	6.75	7.25	8.00	.....

STREET LAMP COCKS.



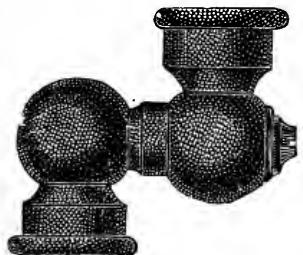
	$\frac{3}{8}$ to $\frac{1}{8}$	$\frac{1}{2}$ to $\frac{1}{8}$	$\frac{3}{4}$ to $\frac{1}{8}$
Price, per doz.....	5.00	6.50	7.50
“ Lever Handle .....	.....	7.50	8.50

REVOLVING COCKS.



	$\frac{1}{4}$ to $\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$ to $\frac{1}{8}$	$\frac{3}{8}$ to $\frac{1}{4}$
Price, per doz.....	7.00	7.00	8.00	8.00
Extra heavy.....	.....	.....	.....	.....
Price, per doz.....	10.80	10.80	10.80	10.80
Extra heavy, Universal..	15.00	15.00	15.00	17.00

TOP SWINGS.



	$\frac{3}{8}$ to $\frac{1}{8}$	$\frac{3}{8}$ to $\frac{1}{4}$	$\frac{3}{8}$ to $\frac{3}{8}$	$\frac{1}{2}$ to $\frac{1}{2}$
Price, per doz.	5.00	5.00	6.00	.....
Extra Heavy.....	.....	7.00	8.10	10.20
“ “ Universal.....	.....	11.50	11.50	.....

MIDDLE SWINGS.

	$\frac{1}{8}$ to $\frac{1}{8}$	$\frac{1}{4}$ to $\frac{1}{8}$	$\frac{1}{4}$ to $\frac{1}{4}$
Price, per doz.	3.75	4.25	4.25
Extra Heavy .....	.....	.....	.....
Price, per doz.	6.00	6.00	7.00
“ “ Universal.....	10.00	10.00	11.50
			11.50

UNIVERSAL SWINGS.

	$\frac{1}{8}$ to $\frac{1}{8}$	$\frac{1}{4}$ to $\frac{1}{8}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{3}{8}$ to $\frac{1}{4}$	$\frac{3}{8}$ to $\frac{3}{8}$
Price, per doz	7.40	7.40	7.90	7.90	8.60

BRASS GAS FIXTURE FITTINGS—Continued.



SIDE NOZZLES.

Size.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$
Price, per dozen.....	1.00	1.70	1.70	....
" extra heavy.....	2.50	....	....	2.80



STRAIGHT NOZZLES.

Size.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$
Price, per dozen.....	1.00	1.70	1.70	....
" extra heavy.....	2.00	....	....	2.60

INDEPENDENT COCKS.

Size, $\frac{3}{8}$	75
---------------------------	------	------	------	------	------	----



Burners.



Pillars.

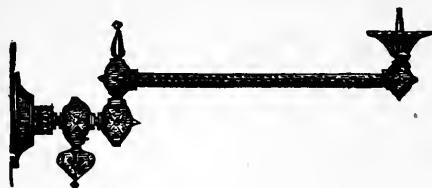


Burner Tips.

Lava Tip Burners, per gross.....	3.75
Scotch Tip Burners, ".....	6.67
Lava Tips, "	1.65
Scotch Tips, "	2.25
Pillars for Tips, "	4.50
Iron or Brass Burners, "	5.00
" " each.....	.05

Chandelier Hooks, 13 cents per pound. Gas Pipe Hooks at Market rates.

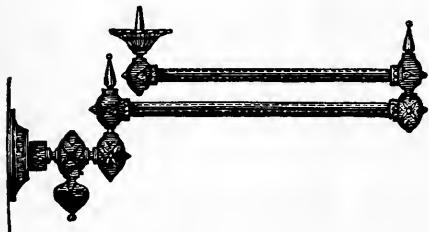
GAS FIXTURE BRACKETS.



No. 100.



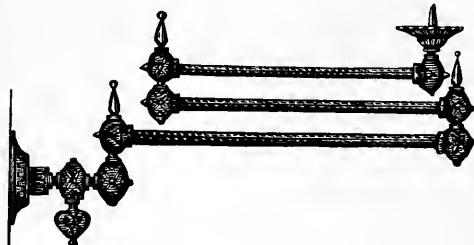
No. 109.



No. 102.



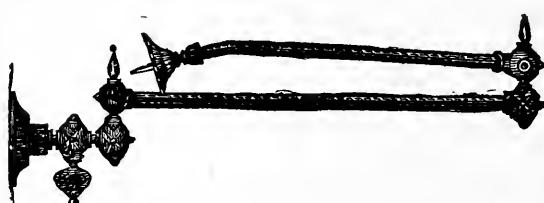
No. 111.



No. 104.



No. 112.



No. 106.



No. 113.

Number 100, Single Swing Bracket, $\frac{3}{8}$.....	.90
" 102, Double Swing Bracket, $\frac{7}{16}$, $\frac{3}{8}$	1.20
" 104, Three Swing Bracket, $\frac{7}{16}$, $\frac{3}{8}$, $\frac{5}{16}$	1.60
" 106, Double Swing Bracket, $\frac{7}{16}$, $\frac{3}{8}$, Universal.....	1.60
" 109, S Bend Bracket, $\frac{5}{16}$.....	.90
" 111, C Bend " $\frac{5}{16}$.....	.90
" 112, C Bend " $\frac{5}{16}$, Stiff.....	.70
" 113, Straight " $\frac{3}{8}$, Stiff.....	.70

DROP LIGHTS, PENDANTS, CHANDELIERS, &c., FURNISHED AT
MANUFACTURERS PRICES.

BLUNT'S UNIVERSAL FORCE PUMPS.

INDOOR FORCE PUMP, ON BASE.



Numbers	0	1	2
Calibre, inches	2 $\frac{1}{2}$	3 $\frac{1}{4}$	4
Length of Stroke, inches.....	4 $\frac{1}{2}$	5	9
Size of Suction Pipe, inches	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$ or 2
Discharge for Pipe or Hose, inches...	$\frac{3}{4}$	1	1 $\frac{1}{4}$
Price for Iron Pump	10.00	12.00	20.00
" Brass Lined Pump.....	12.50	15.00	24.00
Three-way Cock on Spout:			
Price for Iron Pump	12.50	15.00	24.00
" Brass Lined Pump.....	15.00	18.00	28.00
With Nipple, no Spout:			
Price for Iron Pump	9.50	11.50	19.25
" Brass Lined Pump.....	12.00	14.50	23.25

Either of above patterns furnished, bolted on planks,
price \$1.50 extra.



UNIVERSAL, EASTLAKE PATTERN.

WITH 5 FEET SET LENGTH AND CYLINDER, AND DRIP COCK.

	Height.	Stroke.	Calibre of Suction Cylinder.	Suction Pipe.	Discharge	With Iron Cylinder.	The same, with Brass Lined Cylinder.
No. 1 ..	4 ft. 5 in.	5 in.	3 $\frac{1}{4}$ in.	1 $\frac{1}{4}$ in.	1 in.	25.00	28.00
" 2*	5 " 3 "	9 "	4 "	2 "	1 $\frac{1}{4}$ "	39.00	43.00

PRICES OF STANDARD AND CYLINDER, WITHOUT SET LENGTH.

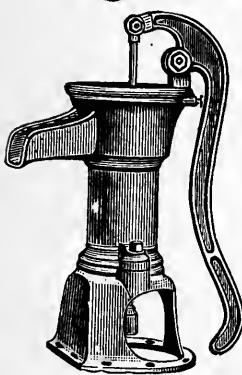
No. 1, for 1 $\frac{1}{4}$ in. Pipe.....	21.50	24.50
" 2*, " 2 " "	35.00	39.00

* Town Fire Pump.



REVOLVING TOP CISTERNS PUMPS,
FITTED FOR LEAD OR IRON PIPE, OR BOTH, AS ORDERED.

Numbers.....	0	1	2	3	4	5	6
Diameters.....	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3	3	3 $\frac{1}{4}$
Size of Pipe.....	1	1	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$
Price, Iron.....	3.50	4.00	4.50	5.00	5.50	6.50	8.00
" Brass Cylinder.....	5.50	6.00	7.00	8.00	10.00	13.00	18.00
" Brass.....	7.75	8.75	10.50	14.00	17.00	21.00	27.00



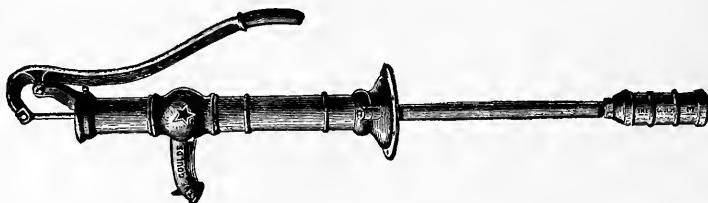
PITCHER SPOUT PUMPS,
WITH EITHER OPEN OR CLOSED TOPS.

FITTED FOR LEAD OR IRON PIPE, OR BOTH, AS ORDERED.

Numbers.....	1	2	3	4	5
Diameters.....	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$
Size of Pipe.....	1	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$
Price.....	4.25	4.75	5.25	5.75	6.25

ANTI-FREEZING WELL PUMPS,

WITH WROUGHT IRON CONNECTING PIPE, AND PATENT SAND VALVE.



WITH OPEN TOPS.

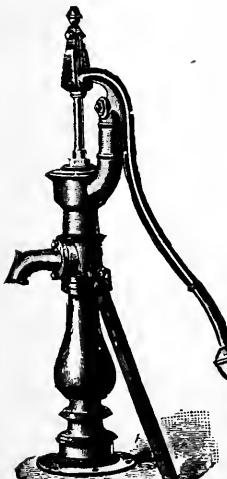
No. 1, 2 $\frac{1}{4}$ in. diam., for 1 in. pipe..	7.00	No. 4, 3 in. diam., for 1 $\frac{1}{4}$ in. pipe.....	8.50
No. 2, 2 $\frac{1}{2}$ " 1 $\frac{1}{4}$ "	7.50	No. 5, 3 $\frac{1}{4}$ " 1 $\frac{1}{4}$ "	9.00
No. 3, 2 $\frac{3}{4}$ " 1 $\frac{1}{4}$ "	8.00		

We can furnish this Pump with cast-iron set length, when so ordered, at same price.

WITH CLOSED TOPS.

No. 2, 2 $\frac{1}{2}$ in. diam., for 1 $\frac{1}{4}$ in. pipe.....	8.25	No. 4, 3 in. diam., for 1 $\frac{1}{4}$ in. pipe.....	9.25
No. 3, 2 $\frac{3}{4}$ " 1 $\frac{1}{4}$ "	8.75	No. 5, 3 $\frac{1}{4}$ " 1 $\frac{1}{4}$ "	9.75

These Pumps furnished with Braces, at no extra charge. Also built with Bolted Cylinder, at same list price, size for size. Length of stroke, 6 inches.



DEEP WELL PUMP STANDARD,

FOR WELLS UP TO 100 FEET DEEP.

Standard complete, screwed for either 1 $\frac{1}{4}$, 1 $\frac{1}{2}$ or 2 in. wrought-iron pipe, as ordered	10.00
Extra flanges for 1 $\frac{1}{4}$ in. pipe.....each	.50
For 1 $\frac{1}{2}$ or 2 in...	".60

By having an assortment of these flanges in stock, a standard can be fitted up for any of the above sizes of pipe. Length of stroke, 7 inches.

FORCE PUMP ON BASE.

WITH REVOLVING BRAKE AND BRASS PISTON ROD.



Iron,	No. 0, 2	in. dia., for 1 in. p...	\$ 8.00
"	No. 2, 2½	" " 1¼ " "	9.50
"	No. 4, 3	" " 1¼ " "	11.00
"	No. 6, 3½	" " 1½ " "	17.00
"	No. 8, 4	" " 2 " "	18.00
Brass Cylinder,	No. 0, 2	" " 1 " "	13.50
"	No. 2, 2½	" " 1¼ " "	14.00
"	No. 4, 3	" " 1¼ " "	15.00
"	No. 6, 3½	" " 1½ " "	24.00
"	No. 8, 4	" " 2 " "	30.00
Brass,	No. 0, 2	" " 1 " "	20.00
"	No. 2, 2½	" " 1¼ " "	21.00
"	No. 4, 3	" " 1¼ " "	32.00
"	No. 6, 3½	" " 1½ " "	38.00
"	No. 8, 4	" " 2 " "	47.00

The 2, 2½ and 3 inch Pumps works 6 inches stroke, and 3½ and 4 inch, 7½ inches.

DOUBLE ACTING FORCE PUMPS.



In general character it partakes of the Steam Pump style, the valves all being grouped together under the air chamber and can be readily exposed to view, by unscrewing the heavy brass nut on top of the air chamber, when the whole pump can be taken apart. The suction and discharge openings screwed for iron pipe, are on both sides of Cylinder (we plug one set), so that suction or discharge can be used on either or both sides if necessary. We always screw them for sizes of iron pipe named below, but can fit them for lead pipe or hose, if ordered.

No. 2, 2½ in. dia., 5 in. stroke, 1¼ in. suction, 1 in. dis.....	\$16.00
No. 4, 3 " 5 " 1¼ " 1 " "	18.00
No. 6, 3½ " 5 " 1½ " 1¼ " "	24.00
No. 8, 4 " 5 " 1½ " 1¼ " "	31.00

We charge extra for brass nipples for lead pipe connections; also for half hose couplings, for hose connections.

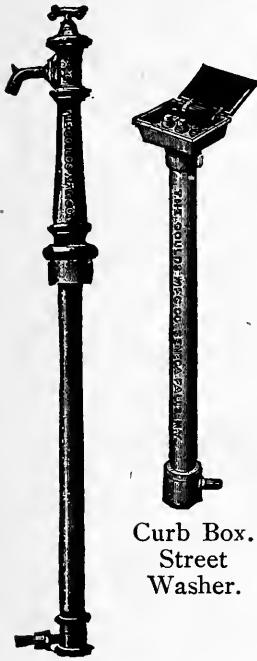
IMPROVED HYDRAULIC RAMS.

For the supply of Dwellings, Factories, Villages, Railroad Stations, Stock Yards, etc., with running water.



SIZE.	Quantity of Water furnished per minute by the fountain to which Ram is adapted.	Caliber of Pipe.		PRICE.
		Drive.	Discharge.	
No. 2....	2 qts. to 2 gallons.	¾ in.	½ in.	\$9.00
No. 3....	1½ gals. to 4 "	1 " "	½ " "	11.00
No. 4....	3 " 7 "	1¼ " "	¾ " "	14.00
No. 5....	6 " 14 "	2 " "	1 " "	22.00
No. 6....	11 " 25 "	2½ " "	1¼ " "	40.00
No. 7....	20 " 40 "	3 " "	1½ " "	75.00
No. 8....	25 " 75 "	4 " "	4 " "	125.00

ANTI-FREEZING HYDRANT AND STREET WASHER WITH COMPRESSION VALVES.



Curb Box.
Street
Washer.

Hydrant.

They are perfectly Anti-Freezing, and are made to set in the ground any depth from 18 inches to six feet. They are almost instantly opened or closed by means of the double threaded brass screw which works the valve below.

They can be repaired from the top without digging up.

Length to set in the ground, inches.	18	24	30	36	42	48	54	60
Hydrant for $\frac{3}{4}$ in. Pipe.....	9.25	9.50	9.75	10.00	10.50	11.00	11.50	12.00
" for 1 in. Pipe.....	11.75	12.00	12.25	12.50	13.00	13.50	14.00	14.50
Street Washer, for $\frac{3}{4}$ in. Pipe.....	7.75	8.00	8.25	8.50	9.00	9.50	10.00	10.50
" " " ".....	9.25	9.50	9.75	10.00	10.50	11.00	11.50	12.00

One Iron Turn Key furnished with each Washer, Extra Street Washer Keys \$3.60 per dozen.

DEEP WELL CYLINDERS.

Size, Inches.	Fitted for inches.	Iron.	Brass Body, Iron Pl'g'r and Att's.	Brass Body, Iron Pl'g'r and Att's.	All Brass.
$2\frac{1}{4}$ x 16	$1\frac{1}{4}$	6.50	12.00	13.50	15.00
$2\frac{1}{2}$ x 16	$1\frac{1}{4}$	7.00	12.50	14.00	15.00
$2\frac{3}{4}$ x 16	$1\frac{1}{4}$	7.50	13.00	14.50	16.25
3 x 16	$1\frac{1}{4}$	8.00	14.00	15.50	17.50
$3\frac{1}{4}$ x 16	$1\frac{1}{2}$	8.50	16.00	18.00	20.00
$3\frac{1}{2}$ x 16	$1\frac{1}{2}$	9.00	18.50	21.00	23.40
$3\frac{3}{4}$ x 16	$1\frac{1}{2}$	9.50	22.50	25.00	27.50
4 x 16	$1\frac{1}{2}$	10.50	26.00	29.00	32.50
$4\frac{1}{2}$ x 16	2	14.00	30.00	35.00	40.00
5 x 16	$2\frac{1}{2}$	20.00	37.00	43.00	50.00

Add from $\frac{1}{2}$ to $\frac{9}{16}$ in. to get outside diameter of cylinders with inside attachments.

DRIVE WELL POINTS.

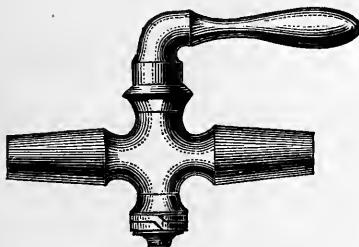


Sizes and Prices.

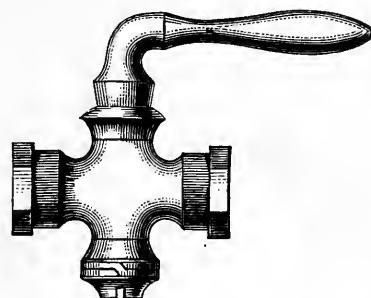
Size of Pipe. Inches.	L'gth of Jack- et. Inches.	Length of Pipe Inches.	No. of Holes.	No. 50 Gauze.	No. 60 Gauze.	No. 80 Gauze.	No. 90 Gauze.
$1\frac{1}{4}$	18	24	80	3.00	3.25	4.00	4.50
$1\frac{1}{4}$	24	30	100	3.75	4.00	5.25	5.75
$1\frac{1}{4}$	30	36	120	4.50	5.00	6.50	7.25
$1\frac{1}{4}$	36	42	160	5.50	6.00	7.50	8.25
$1\frac{1}{4}$	42	48	180	6.00	6.50	8.50	9.25
$1\frac{1}{4}$	48	54	200	6.75	7.25	9.50	10.75

Larger sizes up to 6 inches made to order.

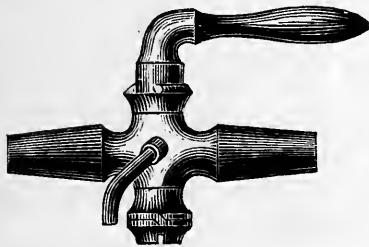
PLAIN STOPS AND BATH COCKS.



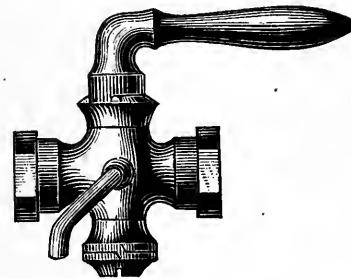
Plain Stop, to Solder.



Plain Stop, Screwed for Iron Pipe.



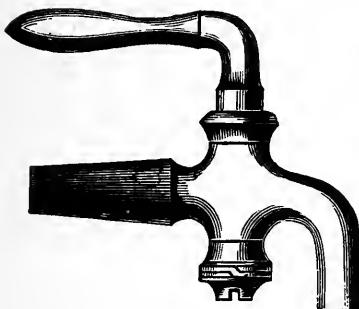
Shower Bath Cock, to Solder.



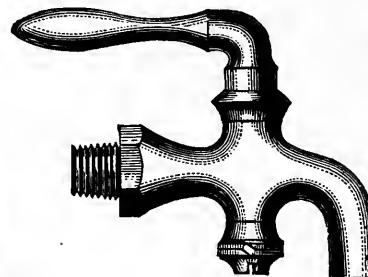
Shower Bath Cock, Screwed for Iron Pipe.

Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	I
Plain Stops, to Solder, Finished, per doz.	10.50	12.50	15.50	18.50	25.00	37.00
“ “ Nickel Plated, per dozen....	12.50	14.50	18.00	21.00	27.50	40.00
“ “ Silver “ “	17.50	20.50	24.50	30.50	40.00	63.00
Plain Stops, Screwed for Iron Pipe, Finished, per dozen.....	11.50	13.50	16.50	20.50	27.00	40.00
“ “ Nickel Plated, per dozen....	13.50	15.50	19.00	23 00	29.50	43.00
“ “ Silver “ “	18.50	21.50	25.50	32.50	42.00	66.00
Shower Bath Cocks, to Solder, Finished, per dozen.....	14.00	17.00	20.00	27.00	40.00	
“ “ “ N'kel Plated, per doz....	16.00	19.50	22.50	29.50	43.00	
“ “ “ Silver “ “	22.00	26.00	32.00	42.00	66.00	
Shower Bath Cocks, Screwed for Iron Pipe, Finished, per dozen.....	15.00	18.00	22.00	29.00	43.00	
“ “ “ N'kel Plated, per doz....	17.00	20.50	24.50	31.50	46.00	
“ “ “ Silver “ “	23.00	27.00	34.00	44.00	69.00	

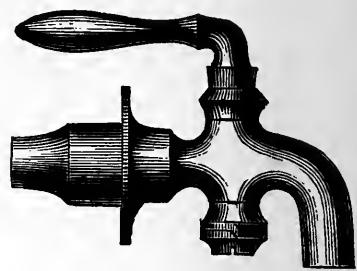
PLUMBERS' BRASS WORK.



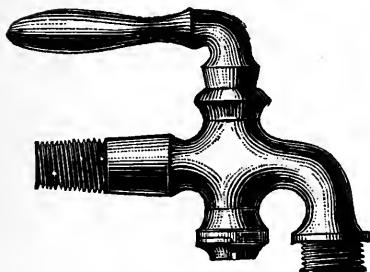
Plain Bibb, to Solder.



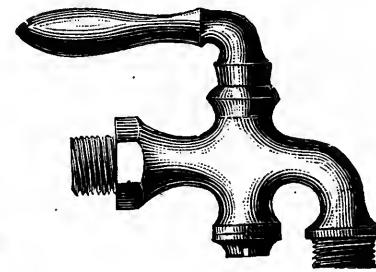
Plain Bibb, Screwed, for Iron Pipe.



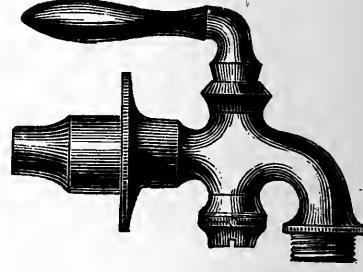
Hose Bibb, Flange and Thimble.



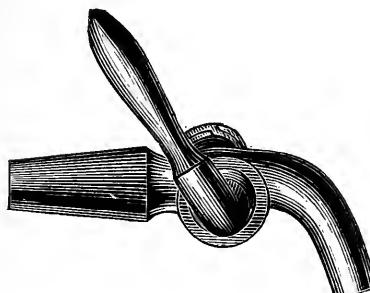
Hose Bibb, to Solder.



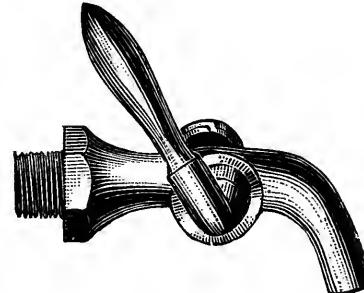
Hose Bibb, Screwed, for Iron Pipe.



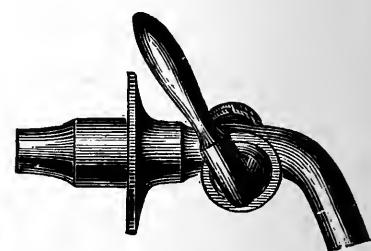
Hose Bibb, Flange and Thimble.



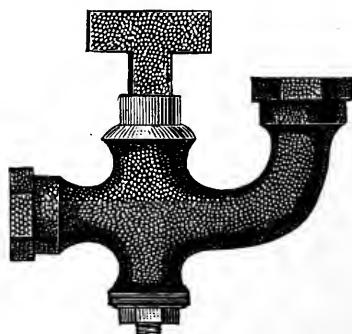
Wash Tray Bibb, to Solder.



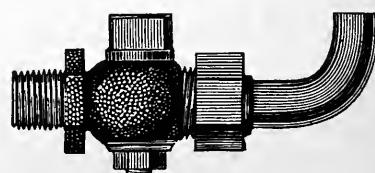
Wash Tray Bibb, Screwed, for Iron Pipe.



Wash Tray Bibb, Flange and Thimble.



Hydrant Cock.



Corporation Stop.

PLUMBERS' BRASS WORK.

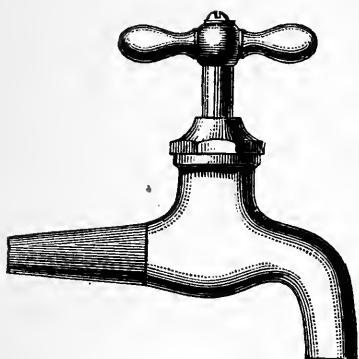
PRICE PER DOZEN.

Size.....	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	2
Plain Bibbs, to Solder:									
Finished.....	10.00	12.00	15.00	18.00	24.00	36.00	60.00	84.00	170.00
Rough	9.00	11.00	14.00	16.00	21.00	32.00	52.00	72.00	150.00
Nickel Plated.....	12.00	14.00	17.50	20.50	26.50	39.00	.....	.....	.....
Silver ".....	17.00	20.00	24.00	30.00	39.00	62.00	.....	.....	.....
Plain Bibbs, Screwed, for Iron Pipe:									
Finished.....	11.00	13.00	16.00	19.00	26.00	39.00	64.00	90.00	180.00
Rough	10.00	12.00	15.00	17.00	23.00	35.00	50.00	78.00	160.00
Nickel Plated.....	13.00	15.00	18.50	21.50	28.50	42.00	.....	.....	.....
Silver ".....	18.00	21.00	25.00	31.00	41.00	65.00	.....	.....	.....
Plain Bibbs, Flange and Thimble:									
Finished			24.00	28.00	40.00	53.00	.....	.....	.....
Nickel Plated			27.50	31.50	44.00	57.00	.....	.....	.....
Silver ".....			36.00	43.00	58.00	81.00	.....	.....	.....
Hose Bibbs, to Solder:									
Finished.....			16.00	19.00	26.00	39.00	69.00	90.00	180.00
Rough			15.00	17.00	23.00	35.00	56.00	78.00	160.00
Nickel Plated.....			18.50	21.50	28.50	42.00	.....	.....	.....
Silver ".....			25.00	31.00	41.00	65.00	.....	.....	.....
Hose Bibbs, Screwed, for Iron Pipe:									
Finished.....			17.00	20.00	28.00	42.00	68.00	96.00	190.00
Rough			16.00	18.00	25.00	38.00	60.00	84.00	170.00
Nickel Plated.....			19.50	22.50	30.50	45.00	.....	.....	.....
Silver ".....			26.00	32.00	43.00	68.00	.....	.....	.....
Hose Bibbs, Flange and Thimble:									
Finished.....			25.00	29.00	42.00	56.00	.....	.....	.....
Nickel Plated			28.50	32.50	46.00	60.00	.....	.....	.....
Silver ".....			37.00	44.00	60.00	84.00	.....	.....	.....
Wash Tray Bibbs, to Solder:									
Finished		13.00	16.00	20.00	26.00	38.00	.....	.....	.....
Wash Tray Bibbs, Screwed, for Iron Pipe:									
Finished.....		14.00	17.00	21.00	28.00	41.00	.....	.....	.....
Wash Tray Bibbs, Flange and Thimble:									
Finished.....			25.00	30.00	42.00	55.00	.....	.....	.....

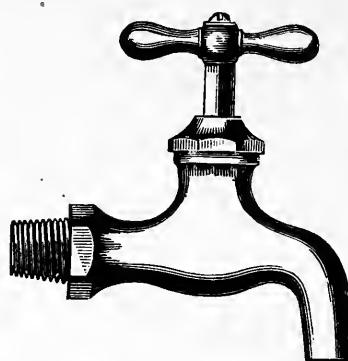
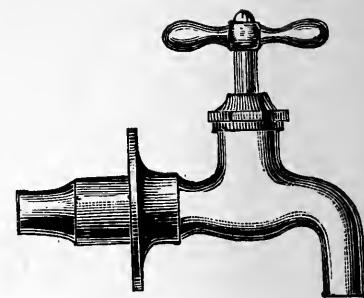
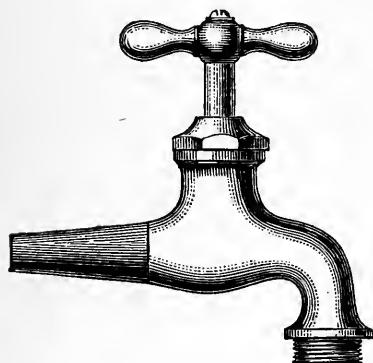
HYDRANT COCKS AND CORPORATION STOPS.

Size.....	3/8	1/2	5/8	3/4	1	1 1/4
Hydrant Cocks						
To Solder	per dozen					
For Lead and Iron Pipe.....	"	14.00	17.00	21.00	33.00	.....
Screwed, for Iron Pipe	"	14.50	18.00	22.00	34.50	.....
Corporation Stops, per doz.:						
For Cement Pipe, with Coupling.....	15.00	18.00	22.00	32.00	50.00	100.00
For Iron Pipe, with Coupling.....	16.00	19.00	23.00	34.00	53.00	104.00
For Iron Pipe, without Coupling.....	13.00	16.00	20.00	29.00	46.00	90.00

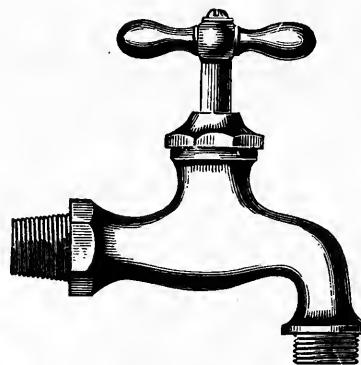
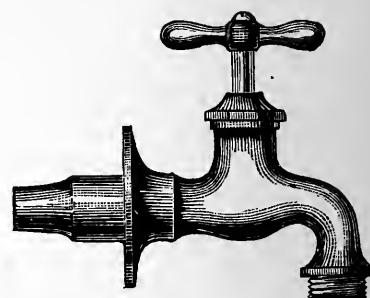
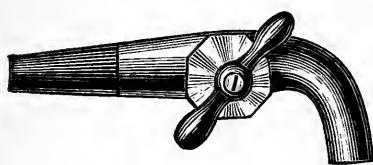
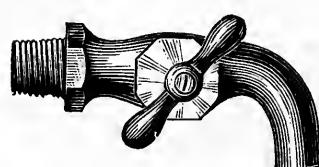
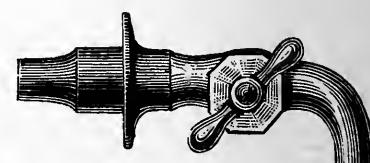
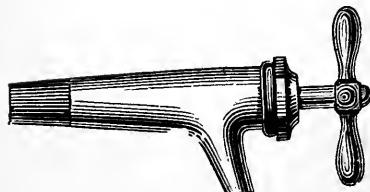
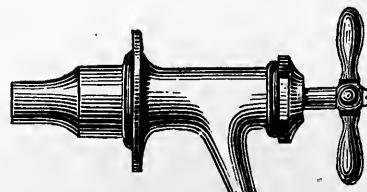
COMPRESSION BRASS WORK.



Plain Bibb, to Solder.

Plain Bibb,
Screwed for Iron Pipe.Plain Bibb,
Flange and Thimble.

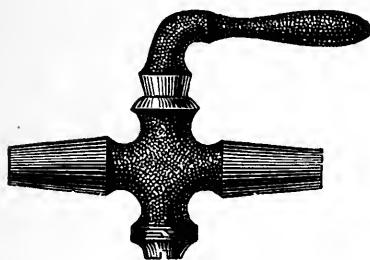
Hose Bibb.

Hose Bibb,
Screwed for Iron Pipe.Hose Bibb,
Flange and Thimble.Wash Tray Bibb,
To Solder.Wash Tray Bibb,
Screwed for Iron Pipe.Wash Tray Bibb,
Flange and Thimble.Straight Wash Tray Bibb,
To Solder.Straight Wash Tray Bibb,
Flange and Thimble.

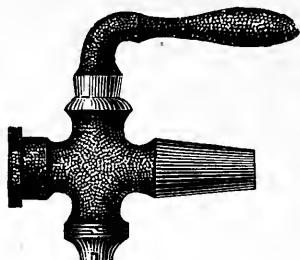
Hopper Cocks.

COMPRESSION BRASS WORK.

Sizes	3/8	1/2	5/8	3/4	1
Plain Bibbs, to Solder:					
Finished per doz.	9.00	10.00	12.00	18.00	34.00
Rough "	8.50	9.50	11.00	17.00	30.00
Nickel Plated "	11.00	12.50	14.50	20.50	37.00
Silver " "	17.00	19.00	24.00	33.00	60.00
Plain Bibbs, Screwed, for Iron Pipe:					
Finished per doz.	10.00	11.00	13.00	20.00	37.00
Rough "	9.50	10.50	12.00	19.00	33.00
Nickel Plated "	12.00	13.50	15.50	22.50	40.00
Silver " "	18.00	20.00	25.00	35.00	63.00
Plain Bibbs, Flange and Thimble:					
Finished per doz.	18.00	21.00	28.00	51.00	
Nickel Plated "	21.50	24.50	32.00	55.00	
Silver " "	30.00	36.00	46.00	79.00	
Hose Bibbs, to Solder:					
Finished per doz.	11.00	13.00	20.00	37.00	
Rough "	10.50	12.00	19.00	33.00	
Nickel Plated "	13.50	15.50	22.50	40.00	
Silver " "	20.00	25.00	35.00	63.00	
Hose Bibbs, Screwed, for Iron Pipe:					
Finished per doz.	12.00	14.00	22.00	40.00	
Rough "	11.50	13.00	21.00	36.00	
Nickel Plated "	14.50	16.50	24.50	43.00	
Silver " "	21.00	26.00	37.00	66.00	
Hose Bibbs, Flange and Thimble:					
Finished per doz.	19.00	22.00	30.00	54.00	
Rough "	22.50	25.50	34.00	58.00	
Nickel Plated "	31.00	37.00	48.00	82.00	
Wash Tray Bibbs:					
Finished, to Solder per doz.	11.00	13.00	19.00	36.00	
" Screwed, for Iron Pipe "	12.00	14.00	21.00	39.00	
" Flange and Thimble.. "	19.00	22.00	30.00	53.00	
Straight Wash Tray Bibbs:					
To Solder per doz.	11.00	13.00	19.00	36.00	
Flange and Thimble "	19.00	22.00	30.00	53.00	
Hopper Cocks per doz.	.....	19.00	.....	.....	.....



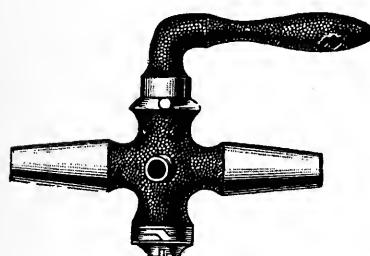
Rough Stop, to Solder.



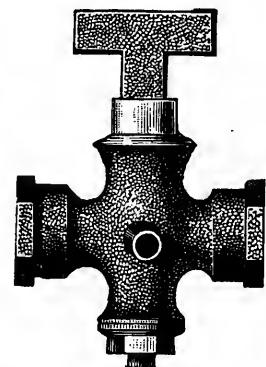
Rough Stop, for Iron and Lead Pipe.



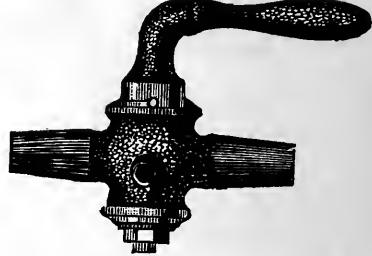
Rough Stop, Screwed, for Iron Pipe.



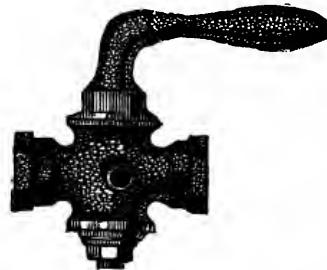
Stop and Waste, to Solder.



Stop and Waste, Screwed, for Iron Pipe.



Round-way Stop and Waste, to Solder.



Round-way Stop and Waste, Screwed, for Iron Pipe.

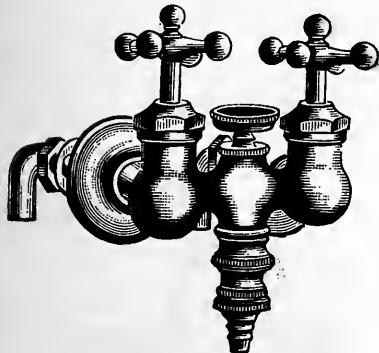
ROUGH STOPS, TEE OR LEVER HANDLE.

Sizes.....	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	2
Rough Stops, to Solder, per doz.....	7.00	9.00	12.00	15.00	19.00	28.00	46.00	64.00	110.00
" " for Lead and Iron Pipe, per doz.....	9.50	12.50	16.00	20.00	29.50	.....	.....	.....	.....
" " Screwed, for Iron Pipe, "	8.00	10.00	13.00	.....	21.00	31.00	50.00	70.00	120.00
Rough Stops and Wastes, per doz.:									
To Solder.....	10.00	13.00	16.00	20.50	30.00	49.00	.....	.....	.....
Screwed, for Iron Pipe.....	11.00	14.00	.....	22.50	33.00	53.00	.....	.....	.....
Round-way Stops and Wastes, per doz.:									
To Solder.....	18.00	21.00	26.50	46.00	73.00	.....	.....	.....	.....
Screwed, for Iron Pipe.....	19.00	23.00	28.50	49.00	77.00	.....	.....	.....	.....

BASIN COCKS.



Number	1	2	3	4½	5	6	7
Finished... per dozen	17.00	18.00	26.00	15.00	20.00	24.00	28.00
Nickel Plated	20.00	21.00	30.00	18.00	24.00	28.00	32.00
Silver	26.00	27.00	38.00	24.00	32.00	38.00	42.00



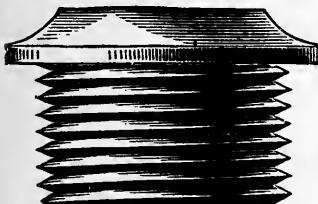
COMPRESSION DOUBLE BATH COCKS,

FOR HOT AND COLD WATER, WITH SPRINKLER AND RING CUP.

Finished	each, 7.50
Nickel Plated.....	" 8.00
Silver	" 9.50

CHAIN STAYS.

Number.....	1	2	3	4	5	6	7	8
Brass	2.00	3.00	3.50	3.50	8.00	10.00	20.00	24.00
Nickel Plated.....	2.50	3.75	4.25	4.25	9.00	12.00	23.00	27.00
Silver	3.00	4.50	5.00	5.00	11.00	14.00	26.00	30.00



HOSE BIBB ENDS.

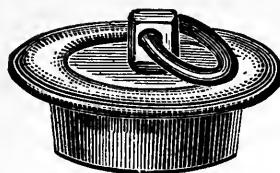
Sizes	½	⅝	¾	1	1¼	1½	2
Price per doz.	2.50	2.50	2.50	3.50	6.00	8.00	15.00

BOILER COUPLINGS.

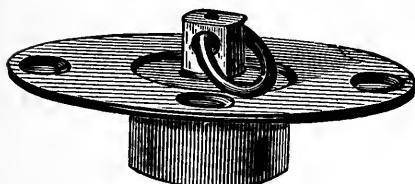


Sizes.....	½	¾	1
For Copper Boilers, per doz.:			
Straight, Plain Face	7.00	7.50	10.00
" Ground Face	8.00	8.50	11.50
Bent, Plain Face	8.00	8.50	11.00
" Ground Face	9.00	9.50	12.50
For Iron Boiler, per doz.:			
Straight, Plain Face	7.50	8.00	11.00
" Ground Face	8.50	9.00	12.50
Bent, Plain Face	8.50	9.00	12.00
" Ground Face	9.50	10.00	13.50
Water Back Couplings:			
Straight, Plain Face per doz.	6.50	7.00	10.00
" Ground Face	7.50	8.00	11.50
Bent, Plain Face	7.50	8.00	11.00
" Ground Face	8.50	9.00	12.50

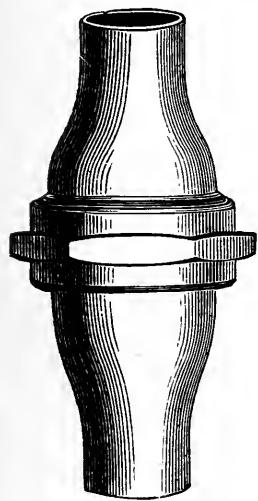
For Iron Boiler,
Straight.



Sink, or Bath Plug.



Wash Tray Plug.



SINK, BATH, OR WASH TRAY PLUGS.

PRICES PER DOZEN.

Sizes	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Sink or Bath Plugs	2.00	2.50	3.00	4.00	5.50	7.00
" " " N. P.	2.50	3.00	3.50	4.50	6.50	8.00
Wash Tray Plugs.....	3.50	3.75	6.00	7.00	9.00	10.00

VALVE COUPLINGS.

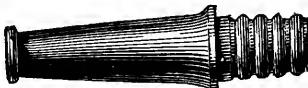
GROUND FACE.

Sizes	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
To Solder.....per doz.	9.00	10.00	12.00	15.00	20.00	30.00	40.00	60.00
Scre'd for Iron Pipe "	10.00	11.00	14.00	17.00	23.00	34.00	44.00	70.00

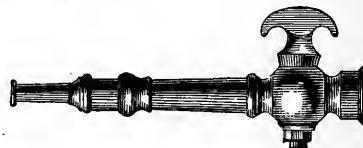
HOSE PIPES.



Plain Hose Pipe, with Screw Tips.



Hose Nozzle, to Tie on.

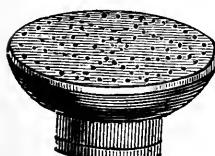


Hose Pipe, Cock on large end.

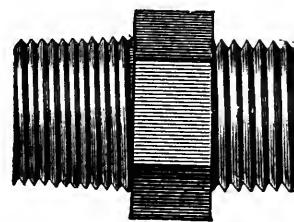
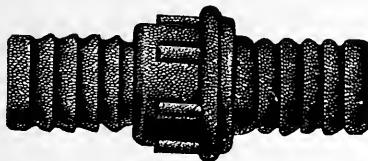
Sizes	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2
Hose Nozzles, to tie on:									
Length.....inches	6	.....	6	.....	.....	.....	.....	.....	.....
Price.....per dozen	3.50	.....	4.00	.....	.....	.....	.....	.....	.....
Hose Pipes, with Screw Tips, Plain:									
Length.....inches	8	12	8	12	12	15	12	15	20
Price.....per dozen	8.00	10.00	10.00	12.00	20.00	24.00	25.00	30.00	50.00
Hose Pipes, Screw Tips, Cock on large end:									
Length.....inches	6	12	8	12	12	20	12	20	20
Price.....per dozen	11.00	18.00	15.00	20.00	40.00	55.00	55.00	80.00	110.00

HOSE SPRINKLERS.

Size.....	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Per dozen.....	3.50	4.50	6.00	9.00	12.00	18.00

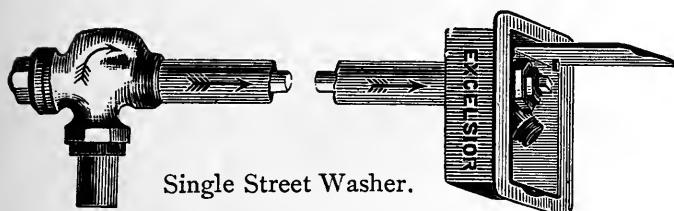
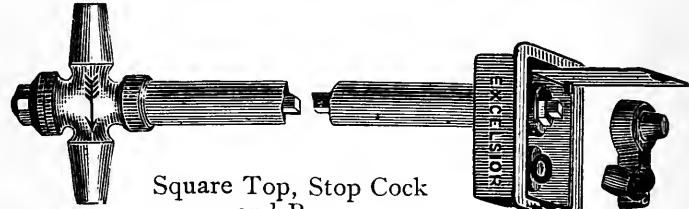


HOSE COUPLINGS AND NIPPLES.



Sizes	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Hose Couplings.....per dozen	2.40	2.40	4.40	10.00	14.00	24.00	.....	.....
" " for Iron Pipe "	2.65	2.65	4.65	10.50	15.00	26.00	.....	.....
Hose Nipples	3.50	3.50	5.00	9.00	10.00	14.00	28.00	40.00

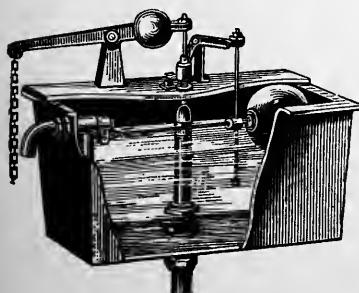
CONNELLY'S PATENT STREET WASHERS AND STOP COCKS.



Sizes	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Single Street Washer:						
Plain Tube	5.00	7.50	11.50	13.50	.....	.....
Galvanized Tube	5.50	8.00	12.00	14.00	.....	.....
Stop Cock and Box:						
Plain Tube	3.00	5.00	6.75	8.50	12.75	15.50
Galvanized Tube	3.75	5.75	7.50	9.00	13.50	16.00

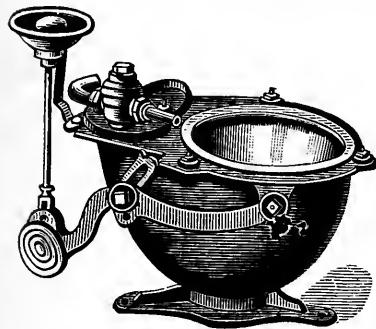
ENTIRE DISCHARGE CISTERN.

This is one of the most simple and effective Entire Discharge Cisterns yet introduced for the flushing of Hopper and Wash-out Closets. One pull, however quick, insures the discharge of the entire contents. It can be operated either by pull or door action, causing a perfect flush in each case.



	Painted.	Galvanized.	Enamelled.
Each	11.50	13.50	14.50

BARTHOLOMEW VALVE CLOSET.

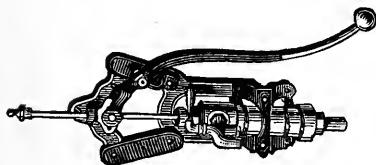


	Tarred.	Galvanized.	Enameled.
Price.....	7.50	9.50	10.00

Nickel Plated Cup and Pull 25 cents extra, net.
 Silver " " " " 50 " " "

SINGLE ACTING LIFT PUMPS,

WITH BIBB AND REVERSIBLE GEAR, MOUNTED ON IRON FRAME.



Sizes	2 Inches.	2 1/2 Inches.
Price	14.00	17.00

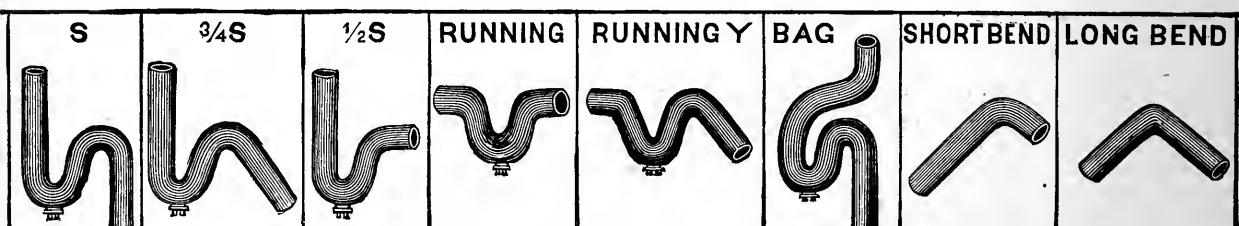
COPPER BALLS.



Size.....	4	5	6	7
Price per dozen	4.50	6.00	7.00	10.50

8, 10 and 12 inch, 80 cents per lb.

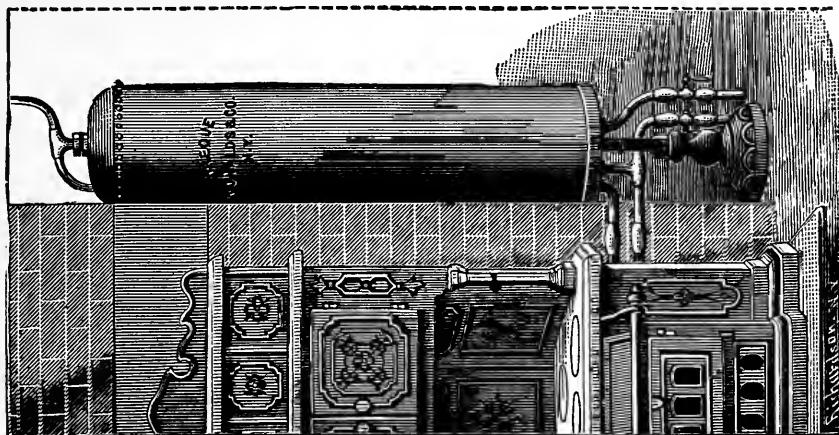
THE "DU BOIS" LEAD TRAPS.



Standard Weight, 6 lbs., Lead.

Sizes.....	1 1/4	1 1/2	2	3	4	4 1/2
Full S Trap .....	.65	.80	1.10	1.70	2.20	3.25
3/4 " " .....	.65	.80	1.10	1.70	2.20	3.25
1/2 " " .....	.55	.70	1.00	1.35	1.70	2.50
Running Trap .....	.60	.75	1.05	1.50	1.85	2.60
" Y Trap .....	.65	.80	1.10	1.70	2.20	3.25
Bag Trap	1.25	1.60	2.00	3.40	4.60	5.00
Long Bend.....	.40	.45	.55	1.00	1.35	2.00
Short " .....	.30	.40	.45	.75	.90	1.50

COPPER AND IRON RANGE BOILERS.



COPPER BOILERS.

Number of Gallons.....	30	35	40	45	50	60	70	80	90	100
Croton Pressure, Round Head...	24.00	27.00	32.00	37.00	41.00	52.00	59.00	68.00	80.00	88.00
Heavy " " " ...	26.00	30.00	34.00	39.00	43.00	55.00	63.00	72.00	84.00	92.00
Double						85.00	....	100.00	....	112.00

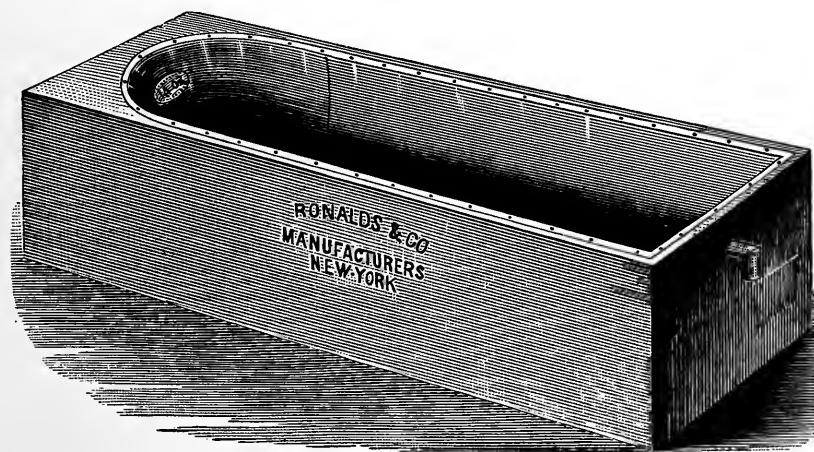
IRON BOILERS.

Capacity	Galls.	18	21	24	27	30	36	35	24	28	32	36	40
Size	Inch	36x12	42x12	48x12	54x12	60x12	72x12	60x13	36x14	42x14	48x14	54x14	60x14
Price, Plain		10.75	11.55	12.50	13.25	14.05	19.00	15.75	14.05	14.85	15.75	16.50	18.25
" Galvanized		14.05	14.85	15.75	17.50	19.00	24.35	20.75	19.00	19.80	20.75	21.50	24.00

Capacity	Galls.	48	42	52	63	53	66	79	82	98	100	120	144
Size	Inch	72x14	48x16	60x16	72x16	48x18	60x18	72x18	60x20	72x20	60x22	72x22	72x24
Price, Plain		24.00	19.00	23.25	29.00	25.00	28.00	33.00	34.00	42.00	42.00	49.00	54.00
" Galvanized		29.75	25.75	30.60	38.00	31.50	36.00	44.00	45.50	54.00	54.00	63.00	61.00

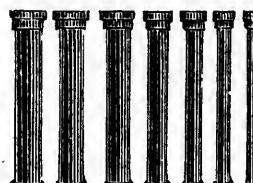
Boiler Couplings, Ground, per set, \$2.75; Plain, \$2.50.

COPPER BATH TUBS.

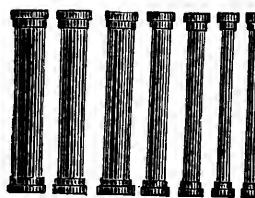


Weight of Copper oz.	10	12	14	16	18	20
4½, 5, 5½ or 6 feet long each	13.75	15.75	17.75	19.75	21.75	23.75
Zinc " " " "	8.00	.....	.....	.....	.....	.....
Foot Tub " " " "	7.00	.....	.....	.....	.....	.....
French, 4½ feet long "	15.00	17.00	19.00	21.00	23.00	25.00
Hip Tub... "	9.00	11.00	.....	.....	.....	.....

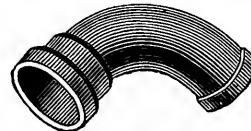
CAST IRON PIPE AND FITTINGS,
SUITABLE FOR SEWER, DRAIN, WATER AND SMOKE.



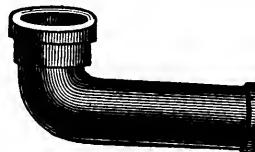
Diameter of Pipe	2	3	4	5	6	7	8
Pipe, Single Hub, per foot. ....	.24	.30	.36	.50	.60	1.00	1.25
“ “ “ extra Heavy.....	.35	.55	.75	1.00	1.20	1.75	2.25



Diameter of Pipe	2	3	4	5	6
Pipe, Double Hub, per length, 5 feet	1.50	1.80	2.10	2.80	3.30
“ “ “ extra Heavy.....	2.05	3.05	4.05	5.30	6.30



Size	2	3	4	5	6	7	8
Quarter Bends.....	.40	.55	.65	1.00	1.20	2.25	3.00
“ “ “ extra Heavy .....	.50	.70	1.10	1.35	1.75	3.00	4.00



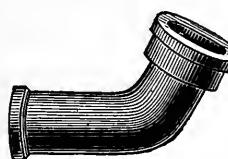
Size.....	4	5	6
Long Bends, 18" Inches.....	1.50	2.25	2.50
“ “ “ extra Heavy	2.25	2.75	3.25

Quarter Bends, with Connections.—Prices, &c., on page 78.



Size	2	3	4	5	6
One-fifth Bends .....	.40	.55	.65	1.00	1.20
“ “ “ extra Heavy .....	.50	.70	1.10	1.35	1.75

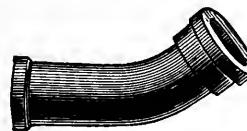
CAST IRON PIPE AND FITTINGS.—Continued.



Size	2	3	4	5	6
One-sixth Bends .....	.40	.55	.65	1.00	1.35
" " extra Heavy .....	.50	.70	1.10	1.20	1.75



Size	2	3	4	5	6	7	8
One-eighth Bends .....	.35	.45	.60	.90	1.05	2.00	2.75
" " extra Heavy .....	.45	.65	1.00	1.20	1.40	2.75	3.75



Size	2	3	4	5	6
One-sixteenth Bends .....	.35	.45	.60	.90	1.05
" " extra Heavy .....	.45	.65	1.00	1.20	1.40



Size	2	3	4	5	6
Double Hub Quarter Bends .....	.70	.85	.95	1.30	1.50
" " " extra Heavy .....	.80	1.00	1.40	1.65	2.05

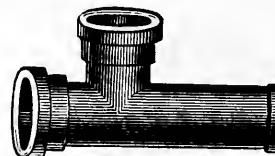


Size	4
Double Hub, Eighth Bends .....	.90
" " " extra Heavy	1.30

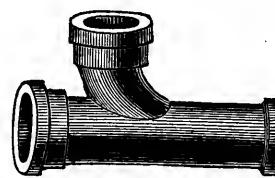


Size	2	3	4	5	6
Return Bends .....	.65	.85	1.25	2.00	3.00
" " extra Heavy .....	.75	1.10	1.75	2.50	3.50

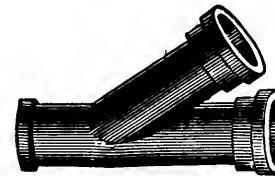
CAST IRON PIPE AND FITTINGS.—Continued.



Size	2	3	4	5	6
Tee Branches.....	.40	.55	.65	1.20	1.40
“ “ extra Heavy.....	.60	.80	1.20	1.50	1.90
Long Tee Branches, 24 ins. clear.....	2.00	2.75	3.50		
“ “ “ “ extra Heavy.....	3.00	4.00	5.00		



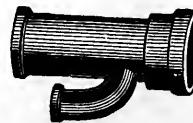
Size	4	5
Tee Y Branches.....	1.20	1.60
“ “ extra Heavy.....	1.60	2.25



Size	2	3	4	5	6	7	8
Y Branches.....	.60	.80	1.20	1.60	2.00	4.00	5.00
“ “ extra Heavy.....	.80	1.25	1.60	2.25	3.25	6.00	7.50

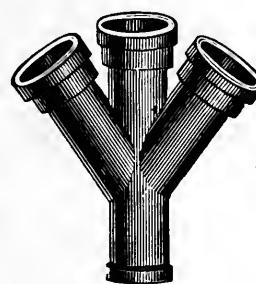


Size	2	3	4	5	6	7	8
Half Y Branches.....	.60	.80	1.20	1.60	2.00	4.00	5.00
“ “ “ extra Heavy .....	.80	1.25	1.60	2.25	3.25	6.00	7.50

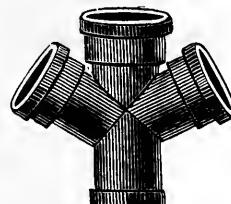


Size	2	3	4	5	6
Ventilating Ys.....	.80	1.25	1.50	2.00	3.00
“ “ extra Heavy.....	1.25	1.75	2.00	2.75	4.00

CAST IRON PIPE AND FITTINGS.—Continued.



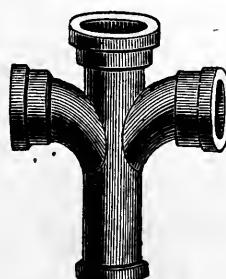
Size	2	3	4	5	6	7	8
Double Y Branches	1.00	1.25	1.65	2.25	3.00	5.50	6.00
" " " extra Heavy.....	1.25	1.60	1.90	3.00	4.00	7.00	9.00



Size	2	3	4	5	6	7	8
Double Half Y Branches.....	1.00	1.25	1.65	2.25	3.00	5.50	6.00
" " " extra Heavy.....	1.25	1.60	1.90	3.00	4.00	7.00	9.00



Size	2	3	4	5	6	7	8
Cross Head Branches.....	.80	1.10	1.25	1.60	2.50	4.00	5.00
" " " extra Heavy.....	1.00	1.40	1.75	2.00	3.25	6.00	7.00

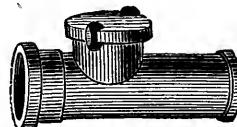


Size	4	5
Double T Y Branches	1.65	2.25
" " " extra Heavy.....	1.90	3.00

CAST IRON PIPE AND FITTINGS.—Continued.



Offsets—Furnished as desired.



Size	4	5	6
Hand Hole Tees.....	.90	1.50	2.00
“ “ “ extra Heavy.....	1.75	2.50	3.75



Size	2	3	4	5	6	7	8
Double Hubs.....	.30	.45	.65	.75	.80	1.40	1.50
“ “ “ extra Heavy.....	.40	.55	.75	.90	1.15	2.00	3.25



Size	2	3	4	5	6	7	8
Single Hubs.....	.25	.35	.40	.60	.75	1.25	1.40
“ “ “ extra Heavy .....	.35	.40	.50	.75	1.00	2.00	3.00



Size	3	4	5	6	7	8
Reducers.....	.45	.50	.70	.80	1.30	1.60
“ “ “ extra Heavy .....	.55	.60	.80	.90	2.00	2.20

Increases—prices, &c., on page 78.



Size	2	3	4	5	6	7	8
Sleeves.....	.30	.45	.65	.75	.80	1.40	1.50
“ “ “ extra Heavy .....	.40	.55	.75	.90	1.15	2.00	3.25

CAST IRON PIPE AND FITTINGS—Continued.



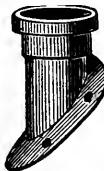
Size...	2	3	4	5	6	7	8
Thimbles, with Covers.....	.40	.50	.60	.70	.90	....	2.25



Size.....	2	3	4	5	6
Thimbles or Ferrules.....	.15	.25	.30	.35	.45
" " Galvanized.....	.25	.40	.50	.60	.75



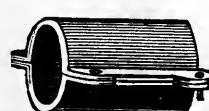
Size.....	2	3	4	5	6	7	8
Saddle Hubs.....	.30	.50	.60	.75	1.10	....	1.50
" " extra Heavy.....	.40	.65	.80	1.00	1.40	....	2.00



Size.....	2	3	4	5	6
Saddle Ys and Half Ys.....	.35	.55	.70	.90	1.25
" " extra Heavy.....	.45	.70	.90	1.15	1.55

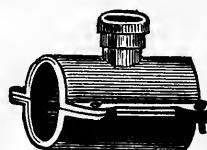


Size.....	2	3	4	5	6	7	8
Pipe Stoppers.....	.15	.25	.30	.35	.50	.90	1.20



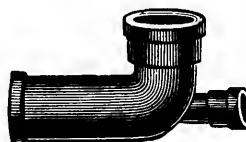
Size.....	2	3	4	5	6
Bands.....	.45	.55	.70	1.00	1.40

CAST IRON PIPE AND FITTINGS.—Continued.

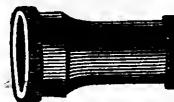


Size.....	2	3	4	5	6
Bands with Outlets.....	.75	.90	1.10	1.45	1.90

QUARTER BENDS, WITH CONNECTIONS ON HEEL OR SIDE.



Size.....	2 x 2	3 x 2	4 x 2	4 x 3	5 x 2	5 x 3	6 x 2	6 x 4
Price.....	.70	.85	.95	1.05	1.30	1.50	1.40	1.70
Extra Heavy.....	.80	1.00	1.40	1.50	1.65	2.05	1.75	2.25



Increases.....		4 to 6	5 to 7	6 to 8
Price.....		1.25	1.60	2.00
Extra Heavy.....		1.75	2.25	2.75

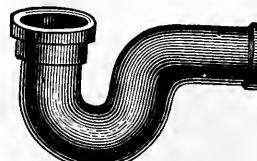
PRICES FOR TARRING PIPE, PER LENGTH, NET.

2 in.	3 in.	4 in.	5 in	6 in.	7 in.	8 in.
.03	.04	.05	.06	.07	.09	.12

PRICES FOR TARRING FITTINGS, PER PIECE, NET.

2 in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.
.02	.03	.04	.05	.06	.09	.12

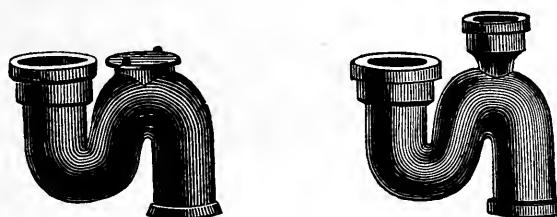
CAST IRON TRAPS.



Without Hand Openings.

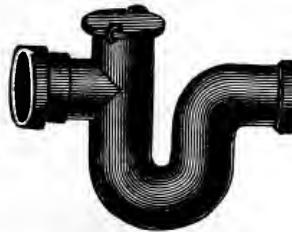
Size.....	1/2 S	3/4 S	Full S
Price.....	1.50	1.50	1.50
“ extra heavy.....	2.50	2.50	2.50

CAST IRON TRAPS.—Continued.

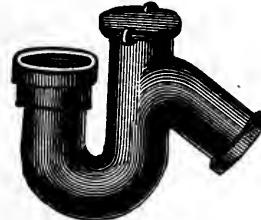


Diameter of Pipe.....	2	3	4	5	6
S. Trap.....	.80	1.25	1.50	3.00	3.75
“ extra Heavy.....	1.25	1.75	2.50	4.00	5.00

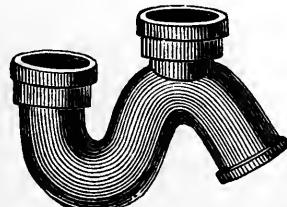
Add for 2 inch Vent, 50 cents.



Diameter of Pipe.....	2	3	4	5	6
Half S Traps.....	.80	1.25	1.50	3.00	3.75
“ “ extra Heavy.....	1.25	1.75	2.50	4.00	5.00

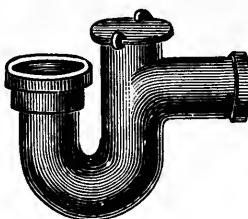


Diameter of Pipe.....	2	3	4	5	6
Three-Quarter S Traps.....	.80	1.25	1.50	3.00	3.75
“ “ “ extra heavy.....	1.25	1.75	2.50	4.00	5.00

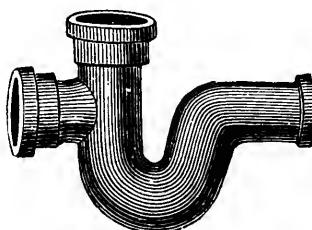


Diameter of Pipe.....	4
Trap with 4 inch Vent.....	2.00

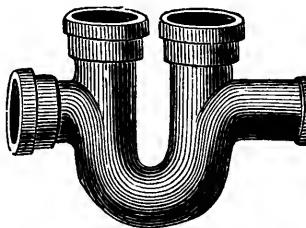
CAST IRON TRAPS—Continued.



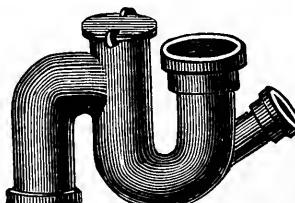
Diameter of Pipe.....	2	3	4	5	6
Running Trap.....	.80	1.25	1.50	3.00	3.75
“ “ extra Heavy.....	1.25	1.75	2.50	4.00	5.00



Diameter of Pipe.....	4	5	6
Running Trap with one Hub Vent	2.00	3.50	4.25
“ “ “ “ extra Heavy.....	3.00	4.50	5.50



Diameter of Pipe.....	4	5	6
Running Trap with two Hub Vent.....	2.50	4.00	4.75
“ “ “ “ extra Heavy.....	3.50	5.00	6.00



Diameter of Pipe.....	1/2 S	3/4 S	Full S
4 inch Trap with Outlets in Heel or Side.....	2.00	2.00	2.00
4 “ “ “ “ “ extra Heavy.....	3.00	3.00	3.00

CAST IRON PIPE FIXTURES.

Diameter of Pipes	2	3	4	5	6
Trap Covers.....	.12	.16	.20	.30	.40



Diameter of Pipes	2	3	4	5	6
Pipe Rests.....	.30	.40	.50	.60	.70



Diameter of Pipes	2	3	4	5	6
Ventilating Caps, with Spigot, short.....	.40	.60	.80	1.10	1.50
“ long .....	.75	1.05	1.35	1.85	2.40



Diameter of Pipes	2	3	4	5	6
Ventilating Caps, with Hubs, short.....	.70	.90	1.10	1.40	1.80
“ long	1.05	1.35	1.65	2.55	2.70



Diameter of Pipes	2	3	4	5	6
Pipe Hooks.....	.08	.10	.12	.15	.20



Diameter of Pipes	2	3	4	5	6
Roof Irons.....	.90	1.15	1.30	1.50	1.80



Diameter of Pipes	3	4	5	6
Leader Pipes, with or without Lugs.....	3.00	4.00	5.00	6.00

CAST IRON FIXTURES.—Continued.

SQUARE SINKS, DEPTH 6 INCHES.



Length, inches.....	16	18	20	20	20	22	23	24	24	24
Width, "	12	12	12	14	20	14	15	14	15	16
Price, Plain.....	1.10	1.25	1.50	1.50	1.95	1.60	1.70	1.70	1.75	1.80
" Galvanized.....	2.30	2.60	3.10	3.20	4.20	3.30	3.75	3.75	3.90	4.00
" Enameled...	4.50	4.75	5.25	6.00	6.75	6.00	6.25	6.25	6.40	6.50
Length, continued.....		24	24	24	25½	25	27	28	28	30
Width	17	18	20	15½	17	15	17	20	12	
Price, Plain.....	1.95	2.10	2.40	1.75	2.10	2.00	2.20	2.70	2.00	
" Galvanized.....	4.20	4.30	5.00	4.00	4.30	4.25	4.50	5.50	4.25	
" Enameled.....	6.75	7.00	7.50	6.50	7.00	7.25	7.50	8.00	7.25	
Length, continued.....	30	30	30	32	32	34	36	36	36	48
Width.....	16	18	20	18	20	20	18	20	22	20
Price, Plain.....	2.25	2.50	3.00	3.00	3.40	3.00	3.00	3.70	3.70	5.30
" Galvanized.....	4.75	5.10	6.25	6.25	7.20	6.50	6.40	7.75	7.75	11.50
" Enameled.....	7.75	8.50	9.00	9.50	9.75	9.50	9.50	10.50	10.50	13.25

CORNER SINKS.



Numbers.	Side.	Front.	Depth.	Plain.	Galvanized.	Enameled.
1	17 in.	24 in.	6 in.	1.25	2.75	6.00
2	20 "	29 "	"	1.75	3.50	7.00
3	22 "	31 "	"	2.10	4.20	8.00

HALF ROUND SINKS.



Numbers.	Side.	Front.	Depth.	Plain.	Galvanized.	Enameled.
1	24 in.	14 in.	6 in.	1.50	3.25	6.00
2	27 "	14 "	"	1.80	3.90	7.00
3	28 "	16 "	"	2.00	4.00	7.75

SLOP SINKS.



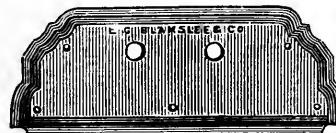
Length.	Width.	Depth.	Plain.	Galvanized.	Enameled
16 in.	16 in.	10 in.	2.70	5.25	7.50
20 "	14 "	12 "	3.50	6.50	8.50
20 "	16 "	12 "	4.00	8.25	10.00

SINK LEGS.



Price.....	Plain.	Galvanized.
	.50	1.00

SINK BACKS.



Size.....	20	22	24	25	25½	27	28	30	32	34	36	38	41	48
Plain.....	1.25	1.35	1.50	1.55	1.60	1.70	1.80	2.00	2.25	2.50	2.75	3.00	3.50	4.25
Galvanized.....	2.25	2.50	2.80	2.90	3.00	3.25	3.50	4.00	4.25	4.75	5.00	5.50	6.00	7.00

IMPROVED KITCHEN SINKS,
WITH BACKS AND LEGS COMPLETE.

Length, inches	30	36	42	45	48	WITHOUT BACKS.			
						30	36	42	48
Width, "	20	22	24	26	26	20	22	24	26
Depth, "	8	8	8	8	8	8	8	8	8
Price, Plain.....	8.00	9.75	12.00	12.75	13.25	6.00	7.00	8.00	9.00
" Galvanized.....	16.00	19.00	23.00	24.00	25.00	12.00	14.00	16.00	18.00
" Enamelled	20.00	24.00	28.00	30.00	32.00	15.00	18.00	20.00	24.00

SINK STRAINERS.

In 4, 4½, 4¾, 5 and 5½ Sizes.



Price per dozen.....	Plain.	Galvanized.	Enamelled.
	1.50	2.60	3.00

PLUG SINK STRAINERS.



Price per dozen.....	Plain.	Galvanized.	Enamelled.
	3.25	5.00	6.00

SINK COUPLINGS.



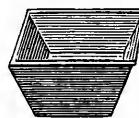
Common, per dozen.....	Plain.	Galvanized.
	1.50	2.00

SINK BOLTS.

	Nickel Plated, per dozen.	Plain, per package (100.)
Per dozen.....	.40	.70 2.00

IRON SINK TRAPS,
FOR IRON OR LEAD PIPE CONNECTIONS.

Half S, Three Quarter S, or Full S, ..	Each 1.25
--	-----------

HYDRANT CESS POOLS.
DEPTH, 6 INCHES.

Size	12 x 12	14 x 14	16 x 16
Price	1.00	1.15	1.30

HYDRANT CESS POOLS,
WITH BELL TRAPS.

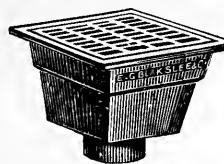
Size.....	12 x 12 x 6	14 x 14 x 6	16 x 16 x 6
Price.....	1.50	1.65	1.80

CESS POOLS, WITH BELL TRAPS.



Size, square inches.....	6	9 1/4	13	13	13	9	8
Size, Outlet.....	2	4	4	..	..	..	..
Outlet, Heavy, for Stable.....	..	..	..	4	5	4	3
Price.....	.75	1.10	1.50	3.00	3.00	1.60	1.25

CESS POOLS, WITH BELL TRAP AND GRATING.



Price.....	4.50
------------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	------

ROUND CESS POOL PLATES.



Diameter, inches.....	4	5	6	7	8	9	10	12
Price.....	.20	.25	.30	.40	.60	.70	.80	1.00

CESS POOL PLATES, WITH BARS.



Size, inches square.....	4	5	6	7	8	9	10	12	16
Price.....	.20	.25	.30	.40	.60	.70	.80	1.00	1.50

CESS POOL PLATES, WITH HOLES.



Size, inches square	4	5	6	7	8	10	12
Price.....	.20	.25	.30	.40	.60	.80	1.00

SIDE WALK GRATES.



Plain.....	2.00	|	Galvanized.....	3.00
------------	------	--	-----------------	------

STOP COCK AND STREET WASHER BOXES, WITH HINGED COVER.



Stop Cocks.....	.75	|	Street Washers.....	1.25
Street Washers, extra heavy.....	.....	.....	.....	3.50

LONG STOP COCK BOXES.



3' 5" and 3' 10" long, each.....	2.00
Rods, each.....	.50

| Keys, each.....

.20

WASH BASINS.



Size, inches.....	12	13	14	15	16	18
Plain	1.25	1.35	1.50	1.75	2.00	2.50
Enameled	2.75	2.85	3.00	3.50	3.75	4.75

VENTILATING CAPS, BOSTON PATTERN.



Size, inches.....	2	3	4
Price.....	.75	1.00	1.25

CORNER URINALS, WITH OR WITHOUT OPENING BEHIND FOR PIPE.



Number.....	1	2	3	4
Size, inches.....	9	10	11	12
Price, Plain.....	1.00	1.10	1.20	1.25
" Galvanized.....	1.70	1.85	2.00	2.25
" Enameled.....	2.25	2.40	2.50	2.75

HALF ROUND URINALS.



Number.	Size, Inches on Back.	Price, Plain.	Price, Galvanized.	Price, Enameled.
1	12	1.00	2.00	2.50
2	15	1.30	2.50	3.00

PHILADELPHIA HOPPERS.



Plain.....	1.25	|	Enameled	2.00
------------	-------	------	--	----------------	-------	------

FRENCH HOPPERS.



Plain.....	1.25	|	Enameled	2.00
------------	-------	------	--	----------------	-------	------

ENGLISH HOPPERS.



Plain.....	1.75	|	Enameled	3.00
------------	-------	------	--	----------------	-------	------

IMPROVED HOPPERS,
WITH STRAIGHT OR SIDE ARMS.

Plain.....	1.75	|	Enameled	3.00
------------	-------	------	--	----------------	-------	------

OVAL CLOSET BOWLS.



Plain.....	1.50	|	Enameled	2.75
------------	-------	------	--	----------------	-------	------

SHORT HOPPERS,
WITH LUGS FOR SEAT AND VALVE ATTACHMENT.

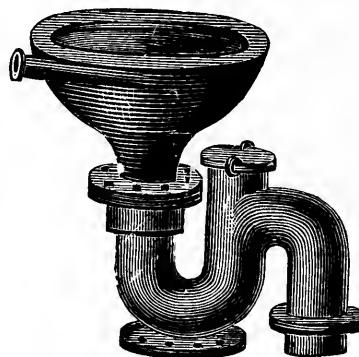
Plain.....	1.75	|	Enameled	2.75
------------	-------	------	--	----------------	-------	------

LONG HOPPERS,
WITH LUGS FOR SEAT AND VALVE ATTACHMENT.



Plain..... 1.75 | Enameled 2.75

SHORT HOPPERS,
WITH S, $\frac{3}{4}$ S OR $\frac{1}{2}$ S TRAP ATTACHED, FOR LEAD OR IRON PIPE CONNECTIONS.



Plain..... 3.25 | Enameled..... 4.00 | Additional for 2 in. Vent... 50

IMPROVED BOILER STANDS.



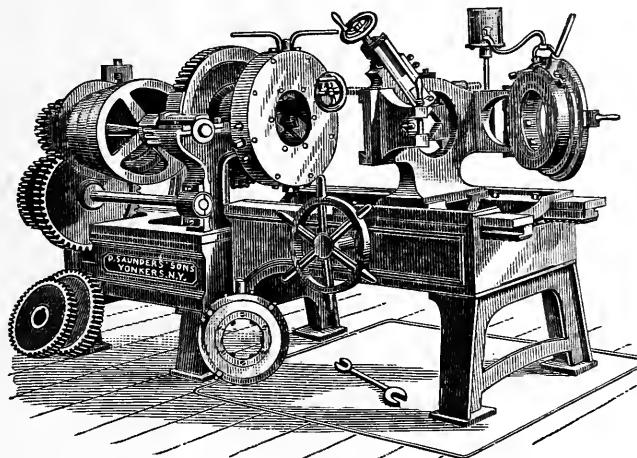
Size, Ring	12	13	14	15	16	18	20	24
Price, Plain	1.25	1.30	1.40	1.50	1.75	2.00	2.25	3.50
" Galvanized	2.50	2.60	2.70	3.00	3.25	3.80	4.50	6.50

IRON TANKS.



	Painted.	Galvanized.
Plate, 18x18	2.50	4.50
" 18x 9	1.25	2.25
Top Railing.....per foot	.40	.60
Braces	2.00	2.50

IMPROVED PIPE CUTTING AND THREADING MACHINES.



SIZES AND PRICES.

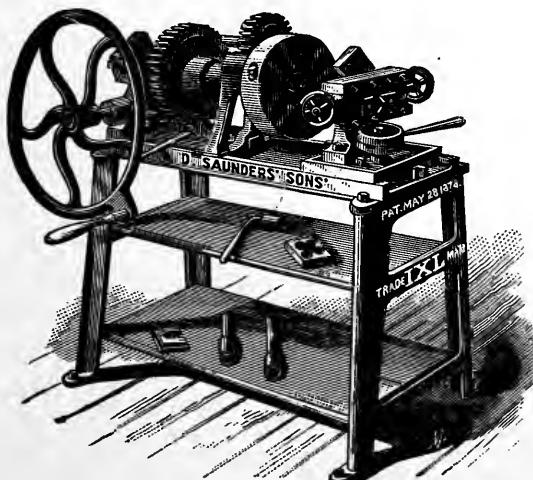
No. 2 threads and cuts off pipe $\frac{1}{4}$ to 2 inches, with solid dies, countershaft, and bushings, complete.....	300.00
No. 3 threads and cuts off pipe $\frac{1}{4}$ to 3 inches, with cutter dies $2\frac{1}{2}$ and 3 inches, solid $\frac{1}{4}$ to 2 inches, countershaft and bushings, complete.....	425.00
No. 4 threads and cuts off pipe 1 to 4 inches, with cutter dies $2\frac{1}{2}$ to 4 inches, solid 1 to 2 inches, countershaft and bushings, complete.....	525.00

SPEEDS OF COUNTERSHAFT.

No. 2—200 revolutions per minute; pulleys, 11 inches diameter.
No. 3—200 revolutions per minute; pulleys, 14 inches diameter.
No. 4—210 revolutions per minute; pulleys, 14 inches diameter.
No. 2—Weight with countershaft and dies, 1000 lbs.
No. 3—Weight with countershaft and dies, 2200 lbs.
No. 4—Weight with countershaft and dies, 2800 lbs.

When these Machines—No. 2, 3, and 4—are made to work by hand as well as power, extra cost \$40.

PATENT "I X L" PIPE CUTTING AND THREADING MACHINE.



For Hand Use, with Dies $\frac{1}{4}$ " to 2". Fly Wheel and set of Sockets for making Nipples $\frac{1}{4}$ " to 2".....

For Power or Hand Use, with Dies $\frac{1}{4}$ " to 2". Fly Wheel, pulleys, countershaft, and sockets for making Nipples $\frac{1}{4}$ " to 2".....

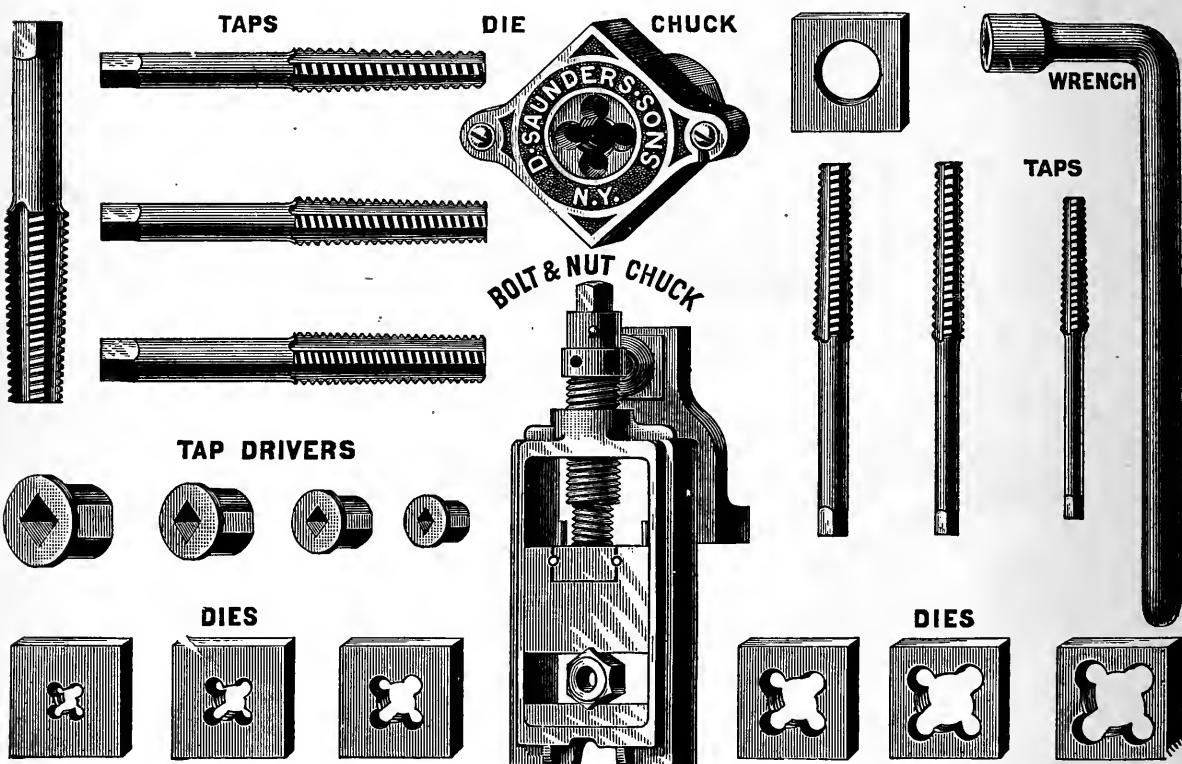
95.00

110.00

BOLT THREADING AND NUT TAPPING ATTACHMENT

FOR THE

I X L PIPE THREADING MACHINE.



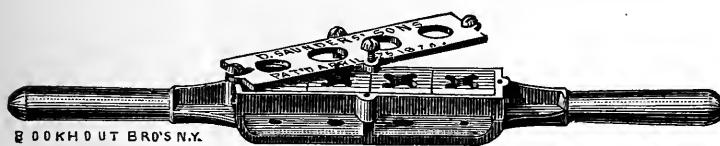
In using the attachment, place the bolt and nut chuck in the die holder of screwing head, bolt the bracket on back of bolt and nut chuck to the screwing head, and grip the die chuck with the gripping chuck of machine, and it is ready for use to thread bolts. To tap nuts, grip the tap drivers in the chuck of machine. With this attachment, it threads bolts and taps nuts $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$ and $1\frac{1}{4}$ inches with solid bolt dies for iron size (that is $\frac{1}{32}$ over standard sizes) and taps one each for same complete.

	PRICE.
No. 1 Attachment with Nut Taps and Solid Bolt Dies $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$ and $1\frac{1}{4}$	76.00
No. 2 Attachment, fits Nos. 3, 4, 5 and 6 Machines, with Nut Taps and Solid Bolt Dies, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$, $1\frac{5}{8}$, $1\frac{3}{4}$, $1\frac{7}{8}$ and 2 inches,	175.00

Other sizes, taps and dies at extra cost. Unless advised to the contrary, we fill orders with \vee threads.

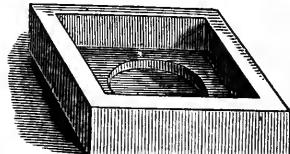
MALLEABLE IRON STOCKS WITH DIES AND GUIDES,

FOR SCREWING IRON PIPE.

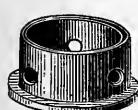


BOKHOUT BROS. N.Y.

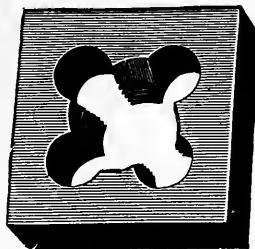
Combination Die Stock, with loose Dies.



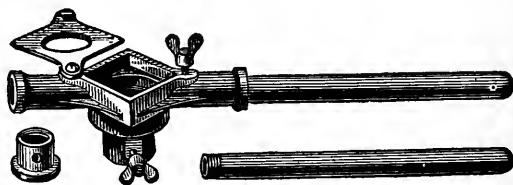
Die Holder.



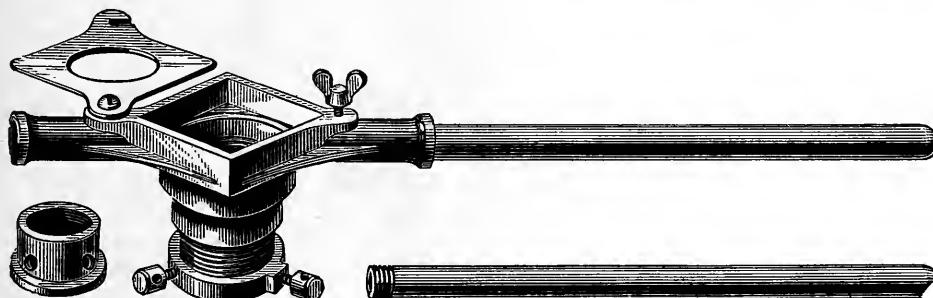
Guide.



Solid Die.



Malleable Iron Stock.



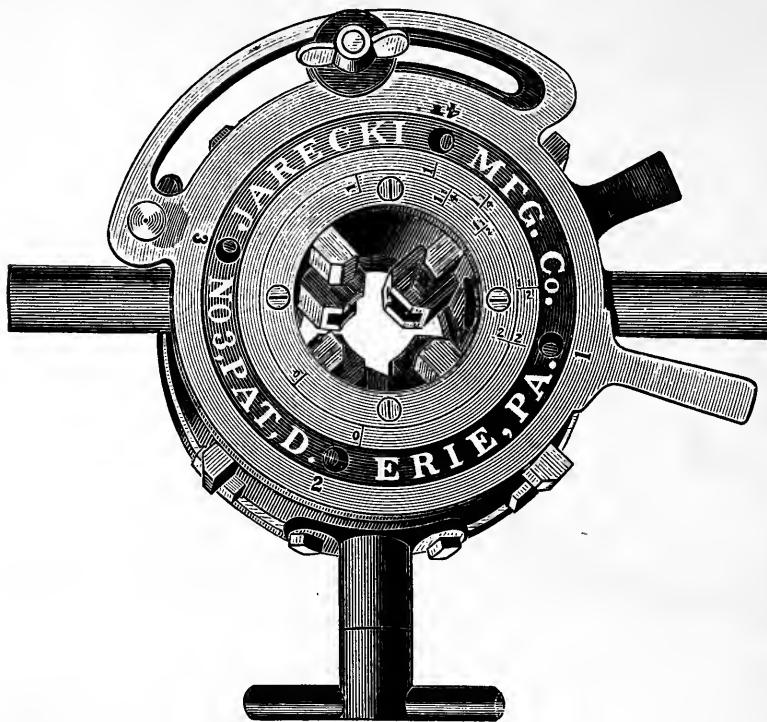
Malleable Iron Stock, loose Handles.

No. 0,	Combination Stock, with Loose Dies, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$	8.00
No. 00,	" " " " $\frac{1}{2}$, $\frac{3}{4}$, 1.....	9.00
No. 1,	Plate with dies 2 in. sq. x $\frac{1}{2}$, cut, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$	6.50
No. 1 $\frac{1}{2}$,	" " " $2\frac{1}{2}$ x $\frac{3}{4}$, cut, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1	10.00
No. 2,	" " " 3 in. sq. x $\frac{3}{4}$ to cut $\frac{3}{4}$, 1 in. pipe.....	8.00
No. 2 $\frac{1}{2}$,	Stock with dies, 3 in. sq. x $\frac{3}{4}$, cut, $\frac{3}{4}$, 1, $1\frac{1}{4}$	10.00
No. 2 $\frac{3}{4}$,	Plate with dies, 3 in. sq. x $\frac{7}{8}$, cut, 1, $1\frac{1}{4}$, $1\frac{1}{2}$	12.00
No. 3,	Plate with dies 4 in. sq. x $\frac{7}{8}$, with Leader Screw, to cut $1\frac{1}{4}$, $1\frac{1}{2}$, 2	15.00
No. 3,	Stock with dies 4x1, with leader Screw, to cut, $1\frac{1}{4}$, $1\frac{1}{2}$, 2	16.00
No. 4,	Plate, with dies, 5 x $1\frac{1}{4}$, with Leader Screw, to cut $2\frac{1}{2}$ and 3 in. pipe	40.00
No. 5,	Plate, with dies, $7\frac{1}{2}$ in. octagon, x $1\frac{1}{4}$, with Leader Screw, to cut $2\frac{1}{2}$; 3, $3\frac{1}{2}$, 4, 5.....	85.00

SOLID DIES (RIGHT OR LEFT), DIE HOLDERS AND GUIDES.

No. of Plate...	0	00	1	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3	3	4	5
Sizes of Dies...	1 $\frac{5}{8}$ x $\frac{1}{2}$	2 $\frac{1}{4}$ x $\frac{3}{4}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$ x $\frac{3}{4}$	3x $\frac{3}{4}$	3x $\frac{3}{4}$	3x $\frac{7}{8}$	4x $\frac{7}{8}$	4x1	5x $1\frac{1}{4}$	7 $\frac{1}{2}$ x $1\frac{1}{2}$
Price.....	1.00	1.50	1.00	1.50	2.00	2.00	2.25	3.00	3.25	10.00	18.00
Die Holders...	....	....	....	....	....	.40	.40	....	.50	1.00	1.50
Guides .....	....	....	.20	.25	.25	.30	.40	.50	.50	1.00	1.50

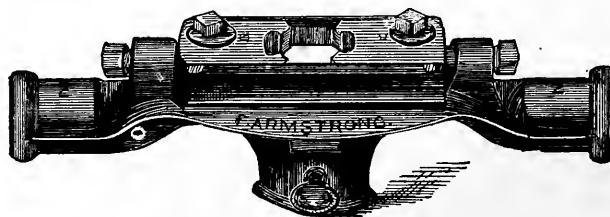
“JARECKI'S” PATENT DIE STOCK.



Number	1,	2,	3,	3½,	4A,
Size of Pipe Threads and Cuts off..	¼ to ¾,	½ to 1¼,	1 to 2,	½ to 2,	1½ to 3 in.
Each, with R. H. Dies.....	14.00	16.00	20.00	22.50	35.00
Extra Dies, per set.....	2.00	2.00	2.00	2 Sets 4.00	3.00

Number	4 B,	5,	6,	7,
Size of Pipe Threads and Cuts off.....	2½ to 4,	4½, 5 & 6,	7, 8 & 9,	10, 12 in.
Each, with R. H. Dies.....	50.00	75.00	175.00	225.00
Extra Dies, per set.....	3.00	6.00	9.00	12.00

“ARMSTRONG'S” ADJUSTABLE STOCK AND DIE.



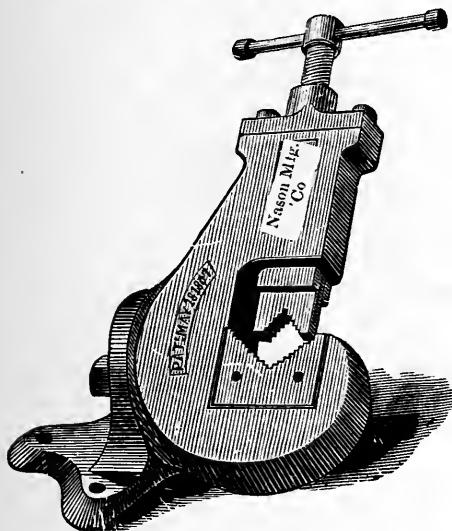
The ARMSTRONG DIES are interchangeable in the Stock, and although adjustable, do not need adjusting to cut the standard size for which the Dies are made. The adjusting is only done when the irregularity or variations in the fitting make it necessary.

Number	1,	2,	3,
Size Pipe to cut.....	⅜ to ½,	¼ to 1,	1¼ to 2 in.
Each, with Dies.....	9.00	12.00	20.00
Extra Dies.....	1.25	1.50	4.00
“ Bushings .....	.20	.20	.50



GLEASON'S PATENT STOCK,
FOR THREADING BRASS PIPE.

To thread $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 inch Pipe.....\$8.00



NASON'S PATENT PIPE VISE.

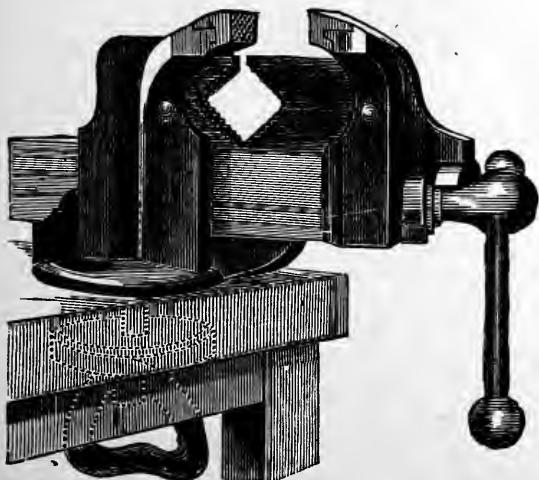
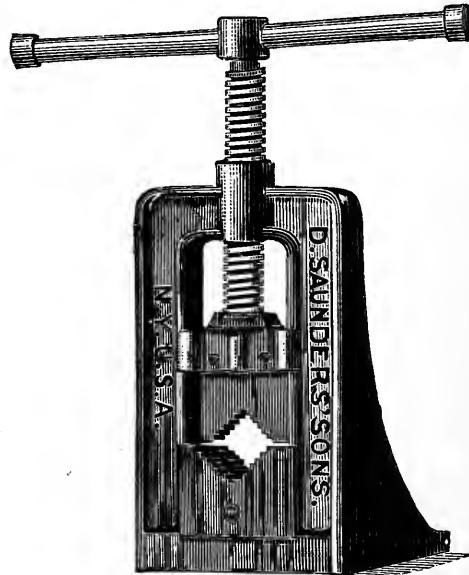
OPEN JAW—WILL TAKE PIPE AT
ANY POINT.

Numbers.....	1	2	3
To take.....	$\frac{1}{8}$ to $1\frac{1}{4}$	$\frac{1}{4}$ to 2	$\frac{1}{4}$ to 3
Price	15.00	18.00	30.00

MALLEABLE IRON PIPE VISE.

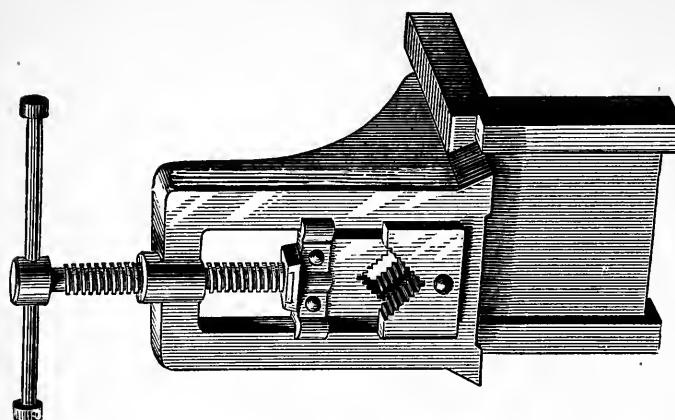
LIGHT, CHEAP AND DURABLE.

Numbers.....	1	2
To take.	$\frac{1}{8}$ to 2	$\frac{1}{4}$ to 3
Price	8.00	12.00



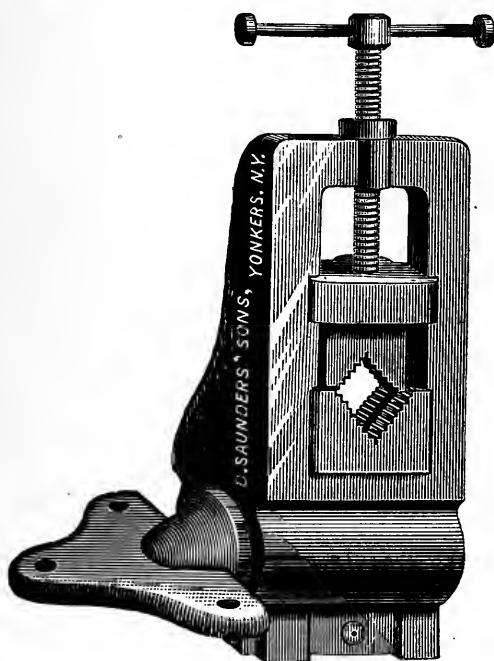
COMBINATION PIPE
AND BENCH VISE.

Numbers.....	1	2
To take Pipe.....	$\frac{1}{8}$ to 2	$\frac{1}{2}$ to 3
Price	16.00	20.00



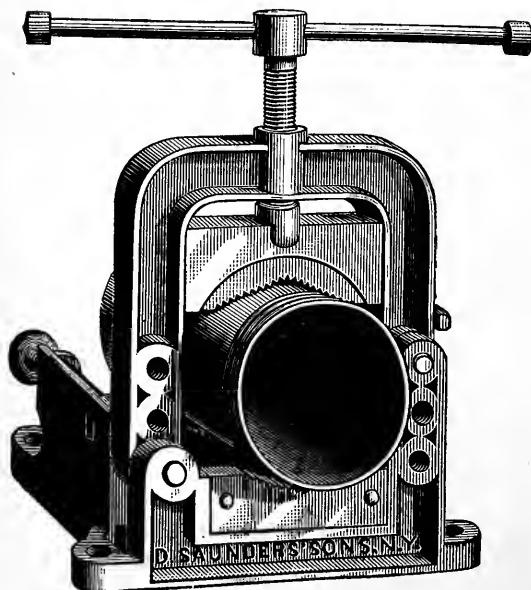
ANGLE PIPE VISE.

Numbers.....	1,	2,	3,
To take.....	$\frac{1}{8}$ to 2	$\frac{1}{4}$ to 3	$\frac{1}{2}$ to 4
Price.....	12.00	16.00	28.00



IMPROVED SWIVEL PIPE VISE.

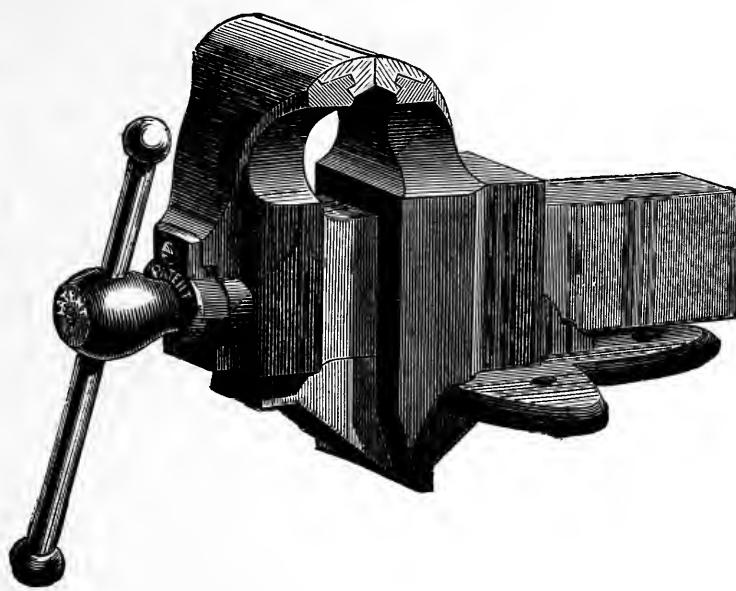
Numbers	1,	2,	3,
To take	$\frac{1}{8}$ to 2	$\frac{1}{8}$ to 3	$\frac{1}{4}$ to 4
Price.....	14.00	18.00	30.00



MALLEABLE HINGE PIPE VISE.

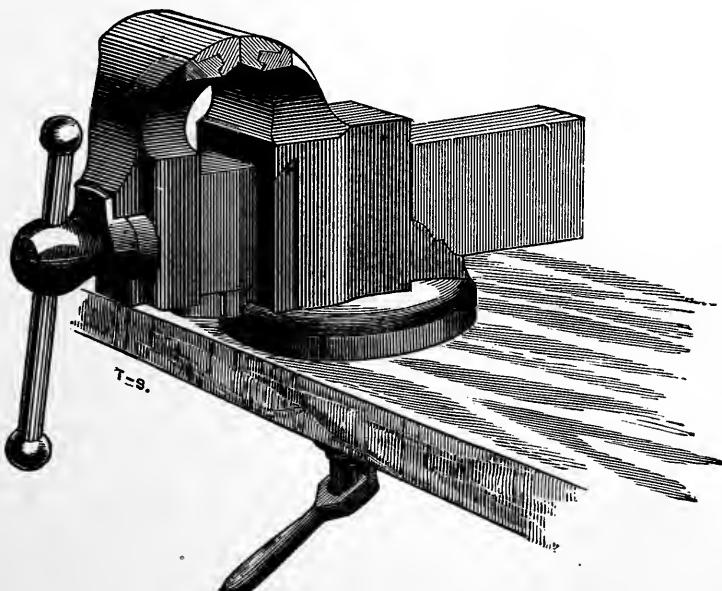
Numbers	1,	2,	3,
To take	$\frac{1}{8}$ to 2	$\frac{1}{4}$ to 3	2 to 6
Price.....	10.00	13.00	30.00

PARKER'S PATENT PARALLEL VISES.



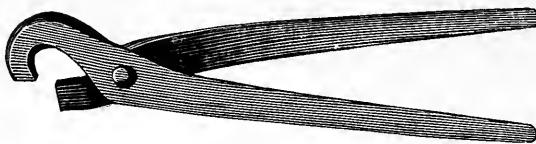
Numbers	000	1	2	3	4	5	6
Weight, lbs.....	23	31 1/2	41 1/2	59 1/2	83	120	237
Length of jaws, inches.....	3 1/4	3 5/8	4 1/4	4 3/4	5 3/8	6 1/8	8 1/8
Price	6.25	7.00	9.00	11.75	16.25	24.00	50.00

PARKER'S PATENT PARALLEL SWIVEL VISES.

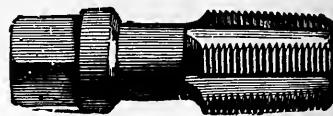


Numbers.....	23	24	25	26
Weight, lbs.....	48	63 1/2	90	131
Length of jaws, inches.....	4 1/4	4 3/4	5 3/8	6 1/8
Price	11.00	14.50	20.50	30.00

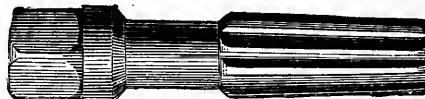
TONGS, TAPS, REAMERS AND DRILLS.



Pipe Tongs.



Pipe Tap.

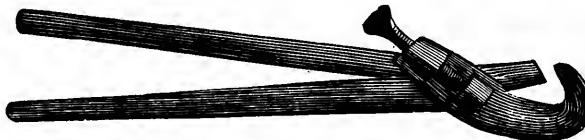


Reamer.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Tongs .....	.44	.52	.56	.72	.90	1.08	1.30	1.50	1.90	2.50	3.25	5.00	6.00
Taps, Right or Left	1.12	1.25	1.50	1.87	2.50	3.12	3.75	4.62	6.25	10.50	15.00	.....	.....
Reamers.....	1.12	1.25	1.50	1.87	2.50	3.12	3.75	4.62	6.25	10.50	15.00	.....	.....
Drills	1.35	1.35	1.80	2.35	2.80	3.20	3.80	4.60	5.50	.....	.....	.....	.....

SPECIAL PIPE TONGS AND WRENCHES.

BROWN'S ADJUSTABLE PIPE TONGS.



Numbers.....	1	$1\frac{1}{2}$	2	3	4	5	6
Will take.....	$\frac{1}{8}$ - $\frac{3}{4}$	$\frac{3}{8}$ -1	$\frac{1}{2}$ - $1\frac{1}{4}$	1-2	$1\frac{1}{2}$ -3	$2\frac{1}{2}$ -4	$3\frac{1}{2}$
Price	1.00	1.25	1.60	2.00	4.00	6.75	18.00

JARECKI'S PATENT TONGS.



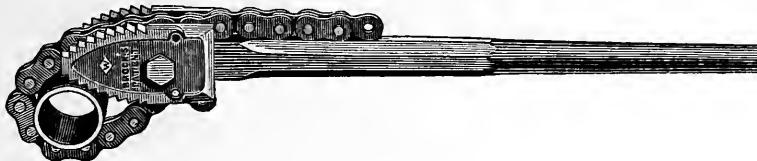
Numbers	1	2	3	4	5
Will take	$\frac{1}{8}$ -1	$\frac{1}{4}$ - $1\frac{1}{2}$	$\frac{1}{2}$ - $2\frac{1}{2}$	$\frac{3}{4}$ - $3\frac{1}{2}$	$2\frac{1}{2}$ -6
Price.....	3.50	4.00	5.00	9.00	16.00

ROBBINS' CHAIN TONGS.



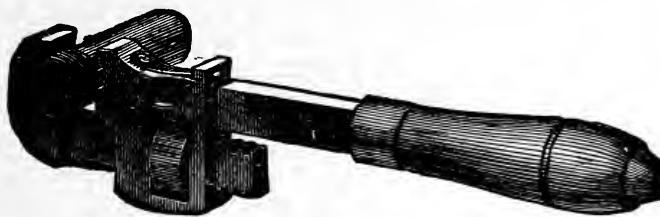
Numbers.....	2	3	4	5	6	7
Will take.....	1-2	$1\frac{1}{4}$ -4	2-6	$2\frac{1}{2}$ -8	4-10	$4\frac{1}{2}$ -16
Price	5.50	6.25	9.00	12.50	16.00	30.00

BROCK'S CHAIN PIPE WRENCH, DROP FORGED FROM BAR STEEL.



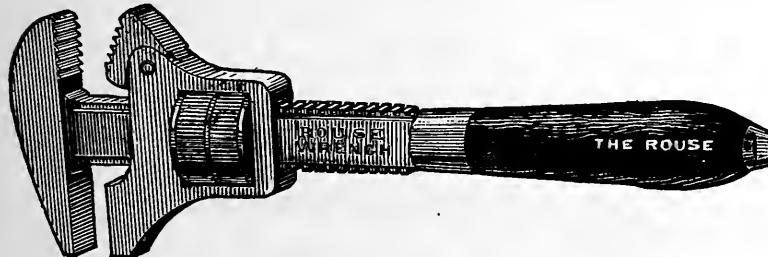
Numbers.....	0	1	2	3	4	5
Will take.....	$\frac{1}{8}$ - $\frac{3}{4}$	$\frac{1}{8}$ to $1\frac{1}{2}$	$\frac{1}{4}$ - $2\frac{1}{2}$	$\frac{3}{4}$ -4	$1\frac{1}{2}$ -8	$2\frac{1}{4}$
Price.....	2.50	3.50	5.50	7.50	11.00	18.00

STILLSON'S PATENT WRENCH.



Length.....	6	8	10	14	18	24	36
Will Take.....	$\frac{1}{8}$ - $\frac{1}{2}$	$\frac{1}{8}$ - $\frac{3}{4}$	$\frac{1}{8}$ -1	$\frac{1}{4}$ - $1\frac{1}{2}$	$\frac{1}{4}$ -2	$\frac{1}{4}$ - $2\frac{1}{2}$	$\frac{1}{2}$ - $3\frac{1}{2}$
Price.....	2.00	2.00	2.25	3.00	4.00	6.00	12.00
Extra Jaws .....	.67	.67	.75	1.00	1.33	2.00	4.00
" Frames..	.25	.25	.33	.45	.55	.65	.75
" Nuts.....	.20	.20	.27	.35	.42	.50	.65

ROUSE PIPE, NUT AND BOLT WRENCH.

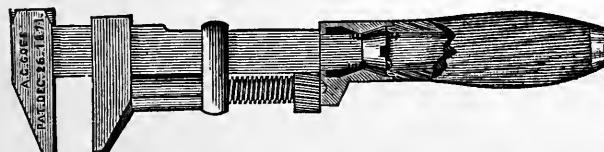


Length..	6	10	12	18
Will take $\frac{1}{8}$ - $\frac{1}{2}$	$\frac{1}{8}$ - $\frac{3}{4}$	$\frac{1}{4}$ - $1\frac{1}{4}$	$\frac{1}{4}$ -2	
Price ...	1.75	2.25	2.75	4.00

BARNES' PIPE WRENCH.

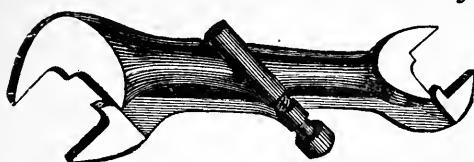
Size	10	14	17
Will Take	$\frac{1}{8}$ -1	$\frac{1}{4}$ - $1\frac{1}{2}$	$\frac{1}{4}$ -2
Price	2.25	3.00	4.00

COES' WRENCHES.



Sizes.....	6	8	10	12	15	18	21
Price, Black.....	.75	.85	1.00	1.17	2.00	2.50	3.00
" Bright.....	.85	.95	1.15	1.35	2.17	2.75	3.25

BAXTER'S ADJUSTABLE "S" WRENCH.



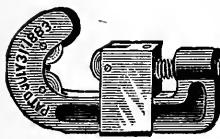
Length.....	4	6	8	10	12	15
Price.....	.50	.75	1.00	1.50	2.00	2.50

WROUGHT IRON KEY WRENCH.



Length of Jaw.....	2½	3	3½	4	4½	5
Price.....	3.00	4.00	5.00	6.00	8.00	10.00

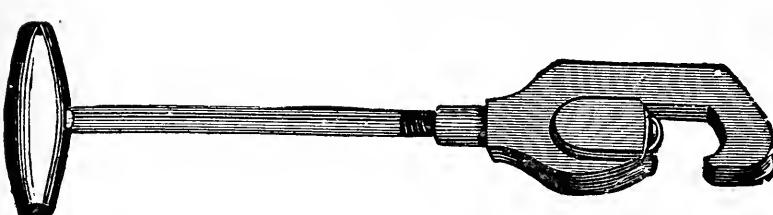
PATENT PIPE CUTTERS.



Barnes' Pipe Cutters.



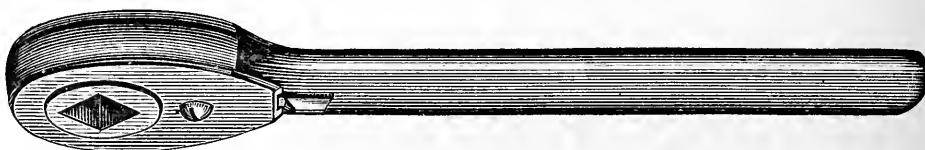
Saunders' Pipe Cutter.



Stanwood's Patent Pipe Cutters, Blocks and Wheels.

Numbers	1	2	3
Barnes' Patent Cutter, to cut pipe.....	½ to 1	½ to 2	1½ to 3
Price	4.50	6.00	10.00
Price, cutters .....	.25	.30	.40
Saunders' Cutter, to cut pipe.....	½ to 1	1 to 2	2 to 3
Price	3.00	4.50	14.00
Price, cutters .....	.24	.32	.60
Stanwood Cutter, to cut pipe.....	½ to	1 to 2	2½ to 3
Case Hardened.....	1.50	2.25	7.00
Steel Faced.....	1.75	2.50	7.50
Wheels.....	.12	.18	.25
Blocks and Wheels.....	.40	.60	1.00

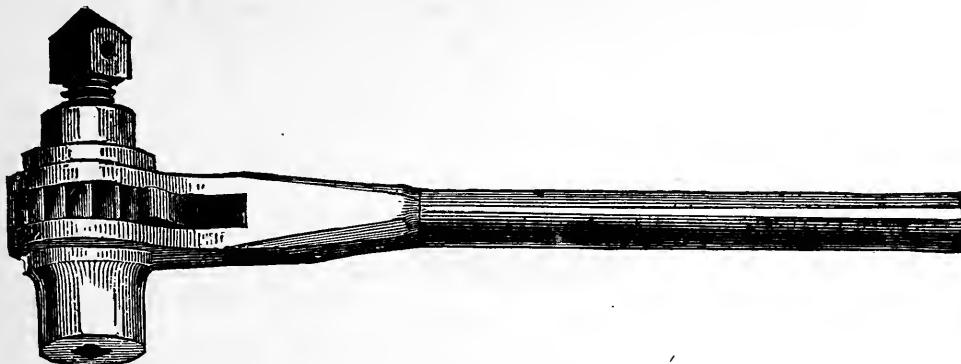
"MOORE'S" RATCHET WRENCH.



LIST OF WRENCH GEARS.

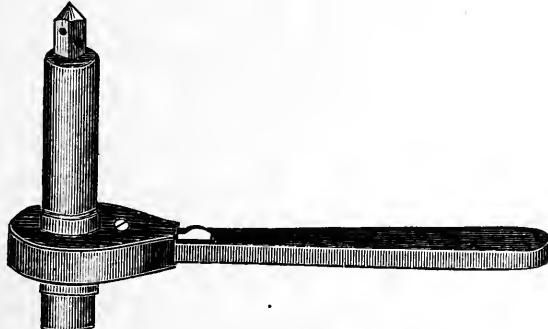
Number.	1,	2,	3,	4,	No. 1,	¾, ½, ½	Square Nut.	½, ¾	Hexagon Nut.
Size of Lever....	8,	10,	15,	18 in.	" 2,	¾, ¾,	"	¾,	¾, 1
Wrenches, each	3.00	4.00	5.00	7.00	" 3,	¾, ¾, 1,	1½,	1,	1½, 1¾
Extra Gears....	.50	.60	.75	1.00	" 4,	1¾, 1¼, 1¾, 1½	"	1¼, 1½, 1¾	"

“PACKER’S” BOILER RATCHET.



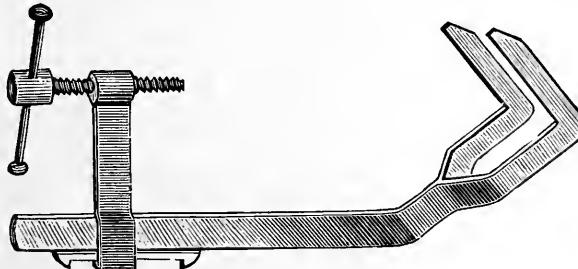
No. 1, 10-inch Handle..... Each, 9.00
" 2, 12 " " " " " " " " 10.50

PATENT RATCHET DRILL.



Number	1	2	3	4
Lever	8	12	15	18 in.
Each...	6.00	8.00	10.00	12.00

CROW FOR DRILLING AND TAPPING.

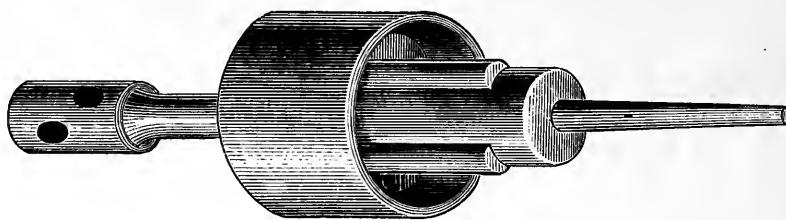


Number	I	2	3
Size..... holds Pipe from	1 $\frac{1}{2}$ to 3	1 $\frac{1}{2}$ to 6	1 $\frac{1}{2}$ to 12 in.
Each.....	10.00	13.00	16.00

GAS PIPE AND BURNER PLIERS.

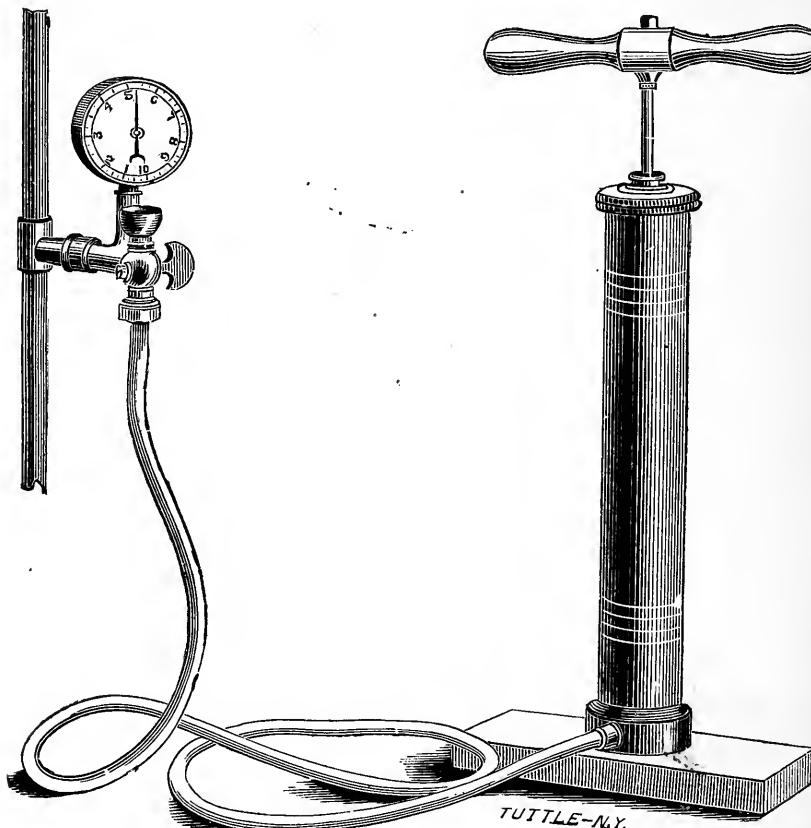


DUDGEON'S BOILER TUBE EXPANDER.



Outside Diameter Tubes..	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	4
Price.....	20.00	25.00	30.00	35.00	42.00	48.00	55.00	60.00	70.00	85.00

In ordering Expanders give thickness of Tube Plate and outside diameter of Tube.



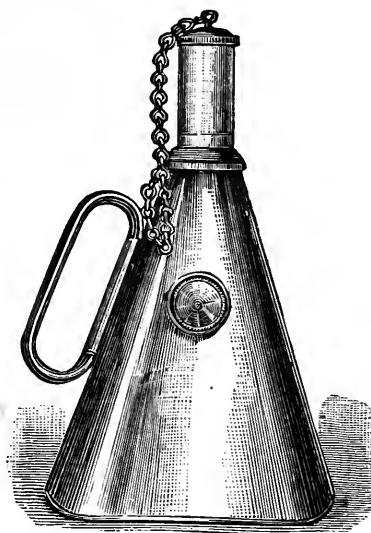
GAS FITTER'S PROVING PUMPS.

Complete with Air Gauge.....	20.00
Ether Cup only.....	5.00
Gauge only.....	10.00
Pump "	10.00

GAS FITTER'S AUGERS.



Size of Gas Pipe.....	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Size of Auger.....	5/8	3/4	7/8	1 1/4	1 1/2	1 3/4	2	2 1/2
Price.....	.80	1.00	1.12	1.60	1.92	2.25	2.50	3.25



PLUMBER'S FORCE PUMPS.

Price..... 12.00

PLUMBER'S TORCH.

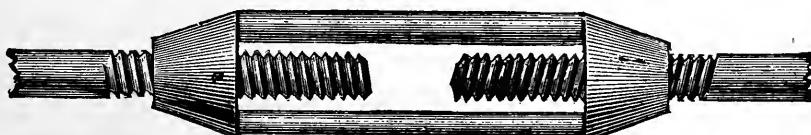
Brass, each.....	1.50
Zinc, "	1.25
Tin, "	1.25

BLOW PIPES.

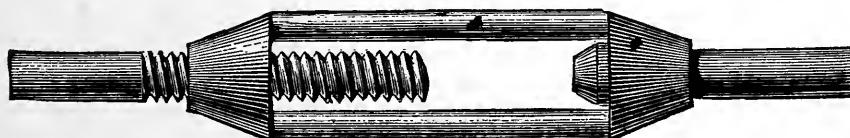


Each.....	.50
With Bulb.....	.50

TURNBUCKLES.

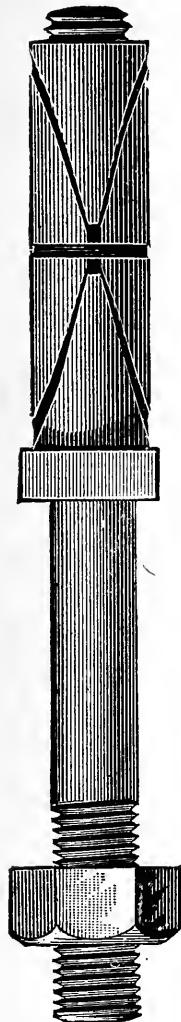


With right hand thread in one end, and left hand in the other.



With Swivel in one end, and right hand thread in the other.

Size.	Price.	Size.	Price.
$\frac{3}{8}$ inch.	.75 each.	$1\frac{3}{8}$ inch.	16 cents per lb.
$\frac{1}{2}$ "	1.00 "	$1\frac{1}{2}$ "	16 " "
$\frac{5}{8}$ "	1.30 "	$1\frac{5}{8}$ "	16 " "
$\frac{3}{4}$ "	1.60 "	$1\frac{3}{4}$ "	16 " "
$\frac{7}{8}$ "	2.00 "	$1\frac{7}{8}$ "	16 " "
1 "	2.50 "	2 "	16 " "
$1\frac{1}{8}$ "	17c. per lb.	$2\frac{1}{8}$ "	17 " "
$1\frac{1}{4}$ "	16c. "	$2\frac{1}{4}$ "	17 " "



THE NEWEL POST OR COLLAR BOLT.

DIAMETER.

Length of Bolt from Collar.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
1	17.00	18.00	21.00	24.00	35.00	38.00	40.00	60.00	100.00	125.00
1 $\frac{1}{2}$	17.05	18.05	21.08	24.09	35.12	38.15	40.18	60.25	100.35	125.45
2	17.10	18.10	21.16	24.18	35.24	38.30	40.36	60.50	100.70	125.90
2 $\frac{1}{2}$	17.15	18.15	21.24	24.27	35.36	38.45	40.54	60.75	101.05	126.35
3	17.20	18.20	21.32	24.36	35.48	38.60	40.72	61.00	101.40	126.80
3 $\frac{1}{2}$	17.25	18.25	21.40	24.45	35.60	38.75	40.90	61.25	101.75	127.25
4	17.30	18.30	21.48	24.54	35.72	38.90	41.08	61.50	102.10	127.70
4 $\frac{1}{2}$	18.35	21.56	24.63	35.84	39.05	41.26	61.75	102.45	128.15	
5	18.40	21.64	24.72	35.96	39.20	41.44	62.00	102.80	128.60	
5 $\frac{1}{2}$	18.45	21.72	24.81	36.08	39.35	41.62	62.25	103.15	129.05	
6	18.50	21.80	24.90	36.20	39.50	41.80	62.50	103.50	129.50	
6 $\frac{1}{2}$	21.88	24.99	36.32	39.65	41.98	62.75	103.85	129.95		
7	21.96	25.08	36.44	39.80	42.16	63.00	104.10	130.40		
7 $\frac{1}{2}$	22.04	25.17	36.56	39.95	42.34	63.25	104.45	130.85		
8	22.12	25.26	36.68	40.10	42.52	63.50	104.80	131.30		
Length of Expansion.	1 $\frac{1}{2}$	1 $\frac{7}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{3}{4}$	3	3	3 $\frac{3}{4}$	4 $\frac{1}{2}$	5
Size Hole to Receive Expansion.	$\frac{7}{16}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{7}{8}$	$\frac{15}{16}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$

SQUARE HEAD, DOUBLE EXPANSION BOLT.



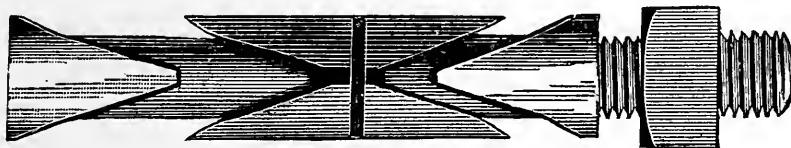
PER HUNDRED.

DIAMETER.

Length Inches...	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
2	9.00	11.00	...	...	...	...	...	...	...	...
2 $\frac{1}{2}$	9.05	11.08	12.50	16.50	...	...	...	...	...	...
3	9.10	11.16	12.60	16.65	20.00	25.00	27.00	...	...	...
3 $\frac{1}{2}$	9.15	11.24	12.70	16.80	20.15	25.25	27.25	...	...	...
4	9.20	11.32	12.80	16.95	20.30	25.50	27.50	42.00	...	...
4 $\frac{1}{2}$	11.40	12.90	17.10	20.45	25.75	27.75	42.30	...	...	...
5	11.48	13.00	17.25	20.60	26.00	28.00	42.60	62.00	...	...
5 $\frac{1}{2}$	11.56	13.10	17.40	20.75	26.25	28.25	42.90	62.43	...	...
6	11.64	13.20	17.55	20.90	26.50	28.50	43.20	62.86	85.00	
6 $\frac{1}{2}$	13.30	17.70	21.05	26.75	28.75	43.50	63.29	85.55		
7	13.40	17.85	21.20	27.00	29.00	43.80	63.72	86.10		
7 $\frac{1}{2}$	13.50	18.00	21.35	27.25	29.25	44.10	64.15	86.65		
8	13.60	18.15	21.50	27.50	29.50	44.40	64.58	87.20		
9	...	...	...	27.75	29.75	44.70	65.01	87.75		
10	...	...	...	28.00	30.00	45.00	65.44	88.30		
Length of Expansion.	1 $\frac{1}{2}$	1 $\frac{7}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{3}{4}$	3	3	3 $\frac{3}{4}$	4 $\frac{1}{2}$	5
Size hole to receive expansion..	$\frac{7}{16}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{7}{8}$	$\frac{15}{16}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$

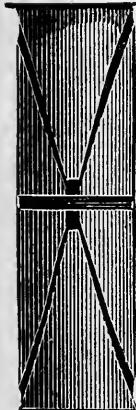
WEDGE HEAD DOUBLE EXPANSION SCREW BOLT.

PER HUNDRED.



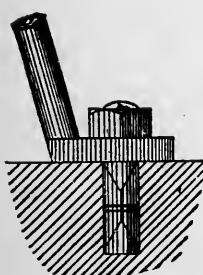
DIAMETER.

Length Over All.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$
2	13.00	14.50	.....	.....	.....	.....	.....	.....
2 $\frac{1}{2}$	13.05	14.55	17.50	22.00	.....	.....	.....	.....
3	13.10	14.60	17.58	22.10	26.00	32.00	33.00	.....
3 $\frac{1}{2}$	13.15	14.65	17.66	22.20	26.12	32.15	33.20	.....
4	13.20	14.70	17.74	22.30	26.24	32.30	33.40	48.00
4 $\frac{1}{2}$	.....	14.75	17.82	22.40	26.36	32.45	33.60	48.25
5	.....	14.80	17.90	22.50	26.48	32.60	33.80	48.50
5 $\frac{1}{2}$	.....	14.85	17.98	22.60	26.60	32.75	34.00	48.75
6	.....	14.90	18.06	22.70	26.72	32.90	34.20	49.00
6 $\frac{1}{2}$	.....	.....	18.14	22.80	26.84	33.05	34.40	49.25
7	.....	.....	18.22	22.90	26.96	33.20	34.60	49.50
7 $\frac{1}{2}$	.....	.....	18.30	23.00	27.08	33.35	34.80	49.75
8	.....	.....	18.38	23.10	27.20	33.50	35.00	50.00
Length of Expansion.		1 $\frac{1}{2}$	1 $\frac{7}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{3}{4}$	3	3
Size Hole to Receive Expansion.		$\frac{7}{16}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{7}{8}$	$\frac{15}{16}$

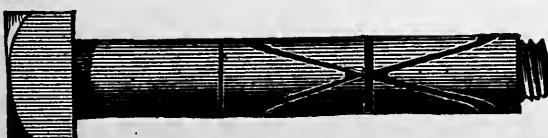


Bolts and Expansions made in Brass when required.

Single Expansions 15 per cent. off of list.



The action of these bolts is here illustrated. The wedge head of the bolt and the expansion over it is put into the hole; then the work to be fastened is put on, and then a common nut serves to draw up the bolt which will cause it to expand and firmly fix the whole together, also shown.

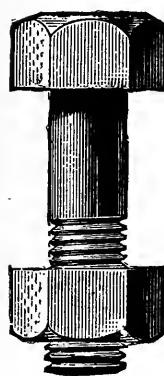


This bolt is furnished to order.

MACHINE BOLTS.

With Square Heads and Nuts, Finished Points, U. S. Standard Threads.

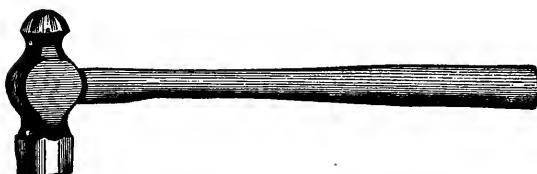
PRICE PER HUNDRED.

Machine Bolt,
Square Head
and Nut.Machine Bolt,
Hex. Head
and Nut.

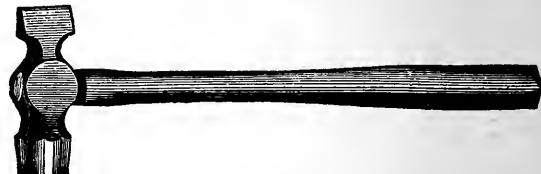
Length	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16} \text{ & } \frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
1 $\frac{1}{2}$	2.80	3.20	3.60	4.60	5.00	7.20	10.50	14.90	22.00
2	2.90	3.35	3.80	4.90	5.30	7.70	11.10	15.80	23.10
2 $\frac{1}{2}$	3.00	3.50	4.00	5.20	5.60	8.20	11.70	16.60	24.20
3	3.10	3.65	4.20	5.50	5.90	8.70	12.30	17.50	25.30
3 $\frac{1}{2}$	3.20	3.80	4.40	5.80	6.20	9.20	12.90	18.30	26.40
4	3.30	3.95	4.60	6.10	6.50	9.70	13.50	19.20	27.50
4 $\frac{1}{2}$	3.40	4.10	4.80	6.40	6.80	10.20	14.10	20.00	28.60
5	3.50	4.25	5.00	6.70	7.10	10.70	14.70	20.90	29.70
5 $\frac{1}{2}$	3.60	4.40	5.20	7.00	7.40	11.20	15.30	21.70	30.80
6	3.70	4.55	5.40	7.30	7.70	11.70	15.90	22.60	31.90
6 $\frac{1}{2}$	3.80	4.70	5.60	7.60	8.00	12.20	16.50	23.40	33.00
7	3.90	4.85	5.80	7.90	8.30	12.70	17.10	24.30	34.10
7 $\frac{1}{2}$	4.00	5.00	6.00	8.20	8.60	13.20	17.70	25.10	35.20
8	4.10	5.15	6.20	8.50	8.90	13.70	18.30	26.00	36.30
9 .....	.....	6.60	9.10	9.50	14.75	19.50	27.70	38.50	
10 .....	.....	7.00	9.70	10.10	15.75	20.70	29.40	40.70	
11 .....	.....	7.40	10.30	10.70	16.75	21.90	31.10	42.90	
12 .....	.....	7.80	10.90	11.30	17.75	23.10	32.80	45.10	
13 .....	.....	.....	.....	11.90	18.75	24.30	34.50	47.30	
14 .....	.....	.....	.....	12.50	19.75	25.50	36.20	49.50	
15 .....	.....	.....	.....	13.10	20.75	26.70	37.90	51.70	
16 .....	.....	.....	.....	13.70	21.75	27.90	39.60	53.90	
17 .....	.....	.....	.....	14.30	22.75	29.10	41.30	56.10	
18 .....	.....	.....	.....	14.90	23.75	30.30	43.00	58.30	
19 .....	.....	.....	.....	15.50	24.75	31.50	44.70	60.50	
20 .....	.....	.....	.....	16.10	25.75	32.70	46.40	62.70	

Bolts with Hexagon Heads or Hexagon Nuts, 10 per cent. extra.

If both Hexagon Heads and Hexagon Nuts, 20 per cent. extra.



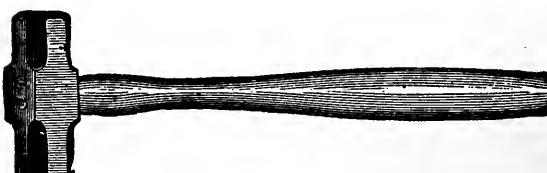
Ball Pene.



Straight Pene.

MACHINISTS' HAMMERS.

Number.....	0000	000	00	0	1	2	3	4	5	6	7	8
Price, per dozen..	11.00	11.00	11.00	13.00	14.00	16.00	18.00	20.00	22.00	24.00	26.00	28.00
Weight : { lbs.	.....	.....	.....	1	1	1	2	2	2	3	3	3
oz....	8	12	.....	4	8	14	3	8	12	.....	5	12



ENGINEERS' HAMMERS.

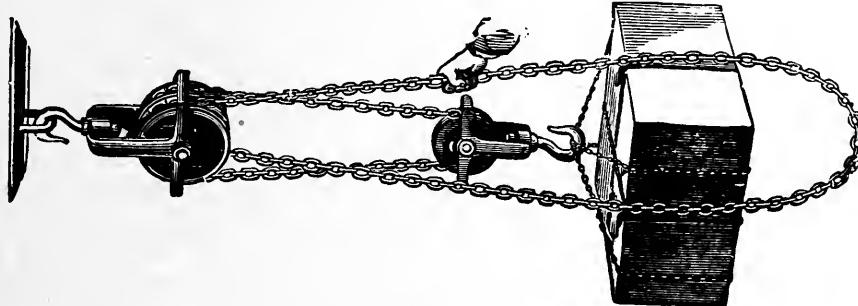
Number.....	0	1	2	3	4	5
Price per doz.	8.50	10.00	12.50	15.00	17.50	19.00
Weight : { lbs.	1	2	2	3	3	5
oz....	10	.....	10	4	14	.....



HAND CHISELS.

Size, inch.....	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Cold Chisels, each.....		.30	...	.35	.35	.40	.50	.55	.60
Cape " "	.35	.40	.50	.60	.70	.80	.90	...	...

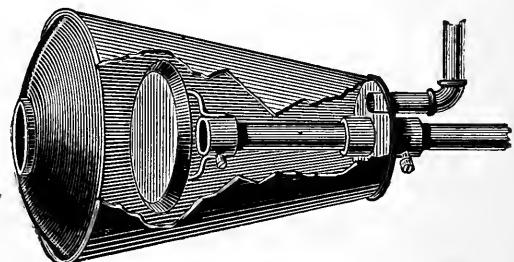
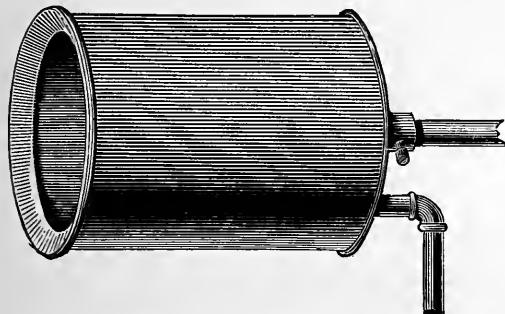
WESTON'S DIFFERENTIAL PULLEY BLOCKS.



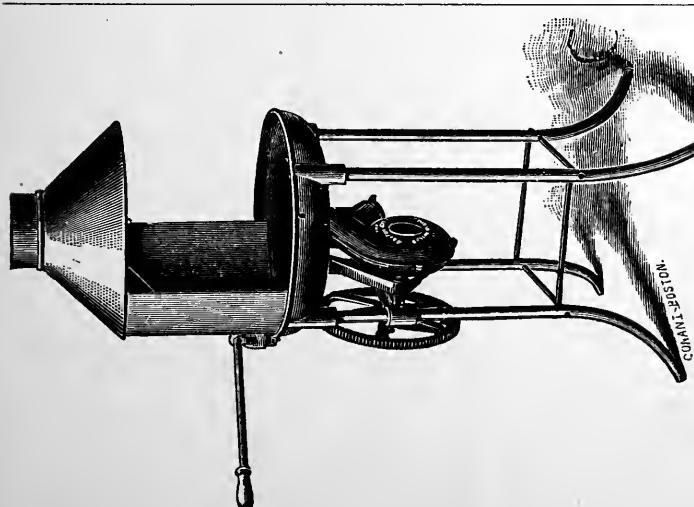
Capacity, Tons.....	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{2}$	2	3
Complete	13.00	15.00	20.00	25.00	30.00	40.00
Chain in Block.....Feet.	22	26	30	33	36	38
Will Lift..... "	6	7	8	8 $\frac{1}{2}$	9	10
Extra Chain, per foot.....	.36	.38	.40	.42	.44	.48

Allow about four feet of chain for each foot of hoist.

CONROW'S EXHAUST CONDENSERS.



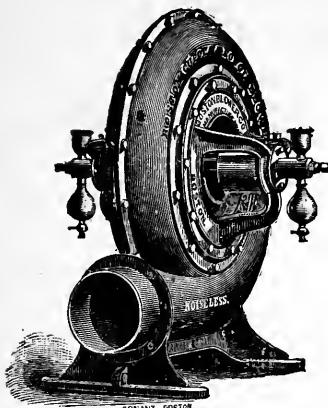
Size.....	2	$2\frac{1}{2}$	3	4	5	6
Price.....	25.00	30.00	35.00	45.00	55.00	65.00



PORTABLE FORGE.

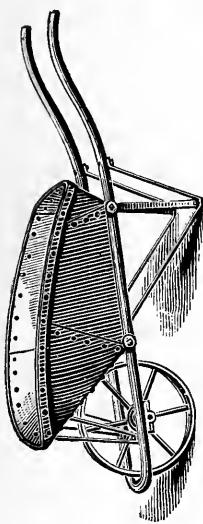
No. 4. With open Bonnet, weight 78 lbs.....	26.00
No. 5. With Low Wind Guard, weight 76 lbs.....	24.00
No. 6. With Closed Bonnet, having Double Doors, w'ght 82 lbs.....	29.00

The Hearth of each of above sizes
is 34 inches high, and 18 inches
diameter.



BOSTON CUPOLA AND FORGE BLOWERS.

Size, inches	12	16	20	24	27	30	35	40	45	53
Prices. (Without Countershafts)	12.	18.	26.	36.	44.	55.	70.	90.	115.	180.
Number of forges Blowers will supply	1	2	3	4	5	6	10	14	20	28

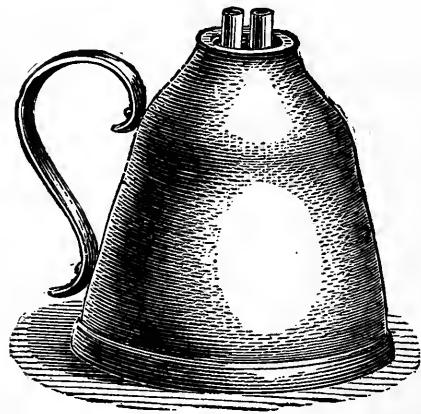


COAL BARROWS.

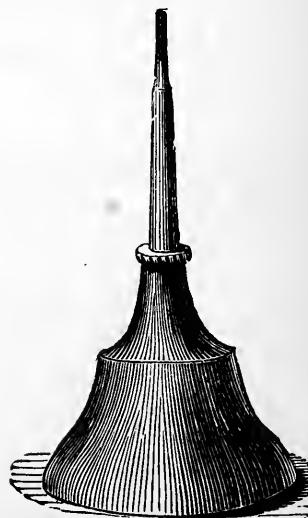
Size A.—With Tray holding 325 lbs. of Coal. Greatest width of Tray, 30 inches. Weight of Barrow, 135 lbs.	price, 26.00
Size B.—With Tray holding 400 lbs. of Coal. Greatest width of Tray, 36 inches. Weight of Barrow, 145 lbs.	price, 29.00
Size C.—With Tray holding 260 lbs. of Coal. Greatest width of Tray, 25 inches, especially designed for use in coal bunkers. Weight of Barrow, 135 lbs.	price, 26.00
Size D.—With Tray holding 300 lbs. of Coal. Weight of Barrow, 98 lbs.	price, 18.00
Size D, No. 2.—With Tray holding 350 lbs. of Coal. Weight of Barrow, —	price, 20.00
Size E.—With Tray holding four bushels of Coke or Charcoal. Weight of Barrow, 126 lbs.	price, 28.00

MALLEABLE IRON OILERS.

MALLEABLE IRON HAND LAMPS.

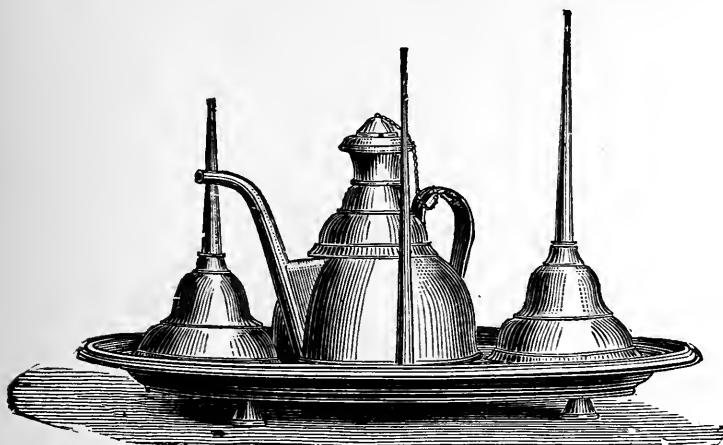


Price per dozen, 5.00



Numbers	1	2	3
Price per dozen, 3.60	4.00	4.40	

Extra Tubes " 1.80



OILER SETS FOR ENGINE ROOMS.

SPUN BRASS, HIGHLY FINISHED.

No. 1.—Small. Two Oilers, with Spring Bottoms, 1 Can, all set in Oval Tray..... 9.00

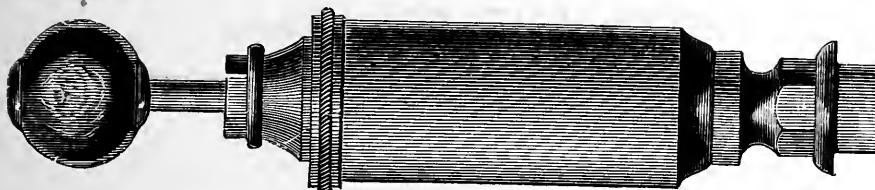
No. 2.—Large. Three Oilers, with Spring Bottoms, 2 Cans, all set in Oval Tray..... 12.00



ADJUSTABLE POP SAFETY VALVES.

Size	inch	1	1 1/4	1 1/2	2	2 1/4	2 1/2	3	3 1/2	4
Locomotive					30.00	40.00	50.00	65.00	.....
Stationary or Marine	15.00	20.00	30.00	.....	50.00	65.00	80.00	100.00		
" with Lock-up			35.00	.....	55.00	75.00	90.00	110.00		
Portable	12.00	15.00	20.00	30.00	.....	.....	.....	.....	.....

In ordering, state pressure to be carried.



OIL PUMPS.

Each 5.00

SCOTCH GAUGE GLASSES, FOR WATER GAUGES.

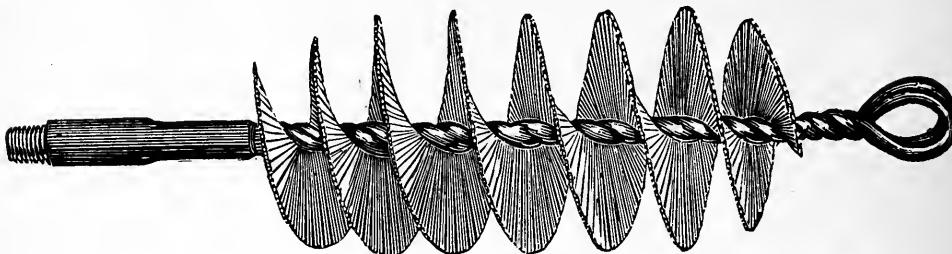


Length	10	11	12	13	14	15	16	17	18	19	20	24	30	48
1/2 inch Diameter .....	.40	.40	.45	.45	.50	.55	.60	.65	.70	.75	.80	1.00	1.35	2.00
5/8 " " .....	.40	.40	.45	.45	.50	.55	.60	.65	.70	.75	.80	1.00	1.35	2.00
3/4 " " .....	.55	.55	.55	.55	.60	.60	.65	.70	.75	.80	.85	1.05	1.50	3.00
7/8 " " .....	.70	.70	.70	.70	.70	.75	.80	.85	.90	.95	1.00	1.50	2.00	4.00
1 " " .....	.90	.90	.90	.90	.90	.90	.90	.95	1.00	1.10	1.25	2.00	2.60	5.00

RUBBER WASHERS, TO FIT TUBES FOR WATER GAUGES.

Size	inch	1/2	5/8	3/4	7/8	1
Price.....per dozen,		.20	.25	.30	.40	.60

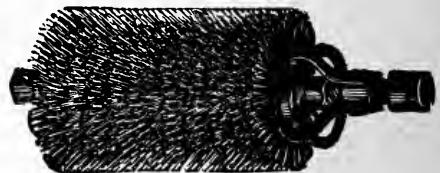
FLUE BRUSHES AND SCRAPERS.



Steel Wire Tube Brush.



Elliptical.



Spencer's Steel Brush Tube Cleaner.

TUBE BRUSHES AND SCRAPERS.

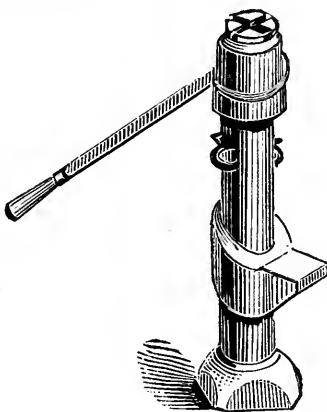
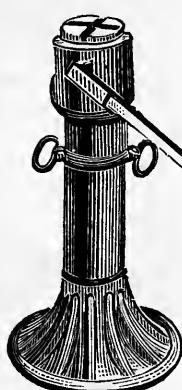
Size.....	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	5	6
Steel Wire Tube Brush	1.10	1.10	1.20	1.20	1.25	1.40	1.50	1.60	1.75	2.00	2.25	2.50	2.50	3.00	....
Whalebone Tube Brush	.75	.75	.75	.80	.90	1.00	1.10	1.25	1.40	1.50	1.75	2.00	2.00	2.50	....
Christoffel's Patent } Scraper, Elliptic...}	2.00	2.00	2.00	2.00	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	....	....
Christoffel's Patent } Scraper, Steel Coil }	1.00	1.00	1.00	1.00	1.10	1.20	1.30	1.40	1.50	1.65	1.75	1.90	2.00	....	....
Nat'nal Tube Scraper } and Smith Adjust'le }	....	2.00	2.00	2.00	....	2.50	....	3.00	....	3.50	....	4.00	5.00	....	....
Spencer's Flue Brush... " Steel Brush }	....	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	5.00	6.00
Spencer's Flue Brush... Tube Cleaner.....}	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	....	....

In ordering Tube Brushes or Scrapers, give *outside* diameter of Tube.

HAIR FELTING.

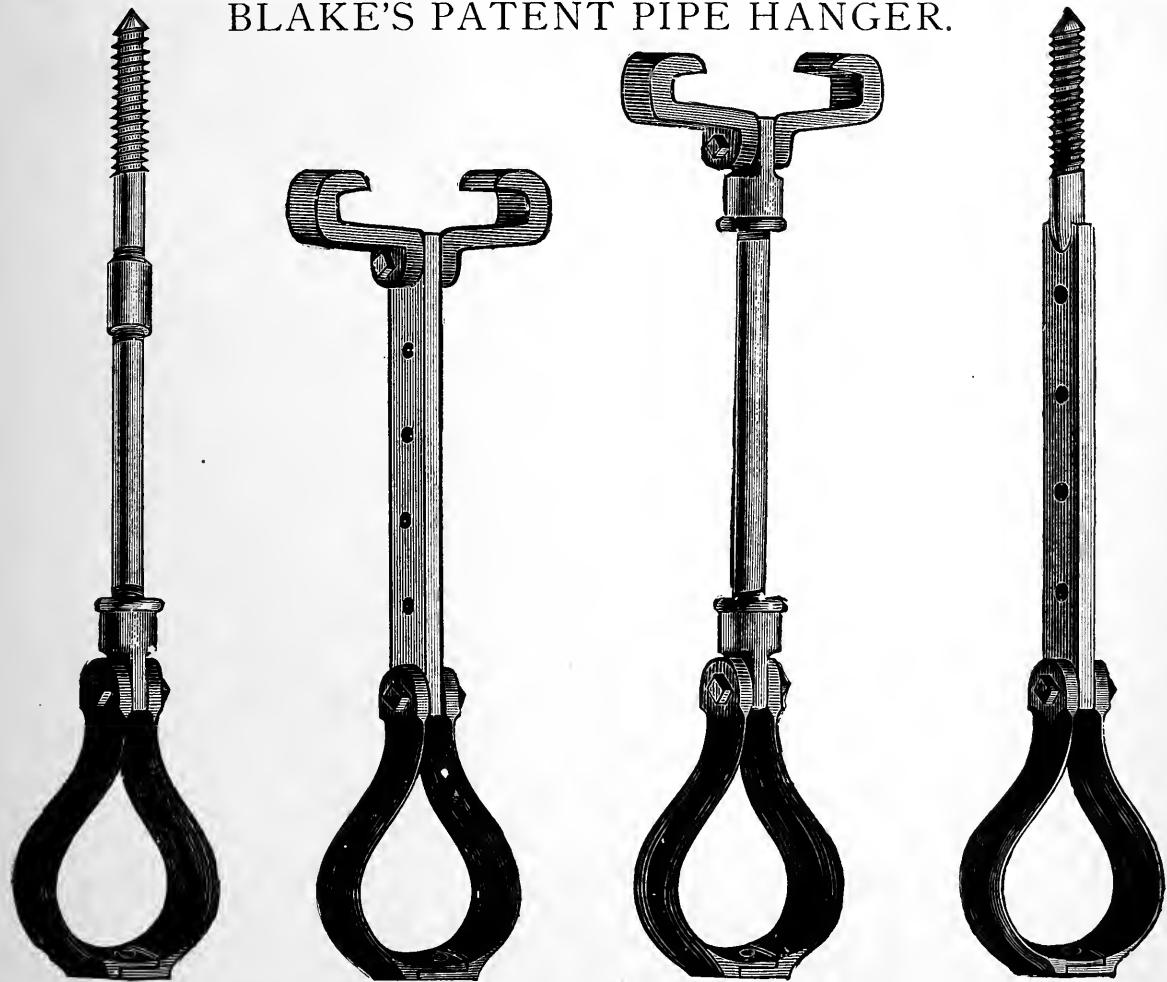
Numbers.....	1	2	3	4
Thickness, inches	1/2	3/4	1	1 1/2
Plain, per square foot.....	6 1/2	8	10	16
With Wool Back, per square foot	18	20	22	25
With Canvas Cover, to order	18	20	22	25

DUDGEON'S HYDRAULIC JACKS.



To Lift or Press, 4 tons, run out 12 in. and lift from the ground.....	60.00
" " 4 " " 24 " "	65.00
" " 7 " " 12 "	70.00
" " 7 " " 24 "	75.00
" " 7 " " 12 " and lift from the ground.....	85.00
" " 7 " " 12 " with wide base for locomotive shops.....	80.00
" " 7 " " 18 "	85.00
" " 7 " " 24 " and lift from the ground.....	90.00
" " 10 " " 12 "	80.00
" " 10 " " 18 "	100.00

BLAKE'S PATENT PIPE HANGER.



No. 1.

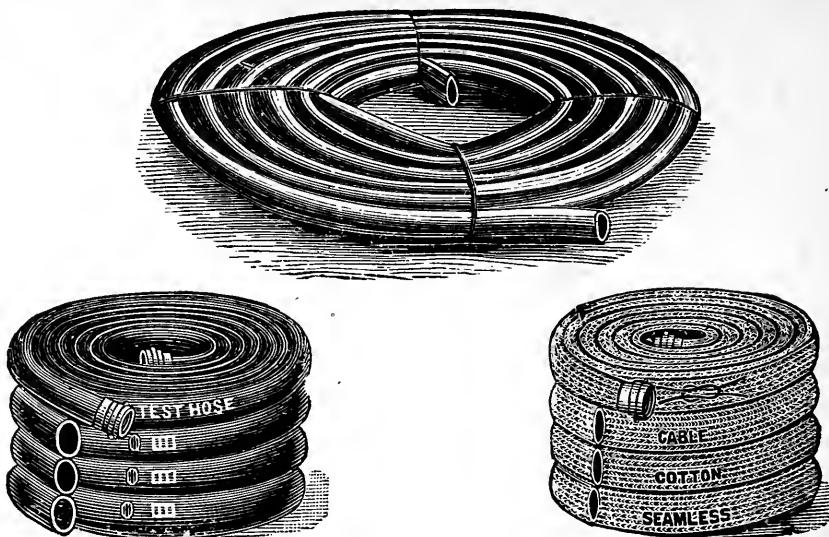
No. 2.

No. 3.

No. 4.

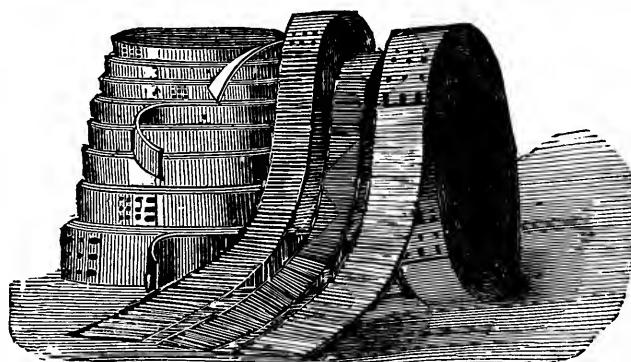
Size.....	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	7	8	9	10	11	12
Hangers, Nos. 1 or 4, complete...	.15	.15	.18	.18	.20	.22	.25	.30	.35	.37	.40	.45	.50	.85	.95	1.05	1.20	1.35	1.55
Hangers, Nos. 2 or 3, complete...	.55	.55	.58	.58	.60	.62	.65	.70	.75	.77	.80	.85	.90	1.25	1.35	1.45	1.60	1.75	1.95

RUBBER HOSE, Etc.



Inside Diameter.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3
Rubber Hose, 2-ply Conducting.....	.20	.25	.33	.42	.50	.58	.66	.83	1.00
" 3 " Hydrant.....	.25	.30	.40	.50	.60	.70	.80	1.00	1.20
" 4 " Engine.....	.30	.37	.50	.62	.75	.87	1.00	1.25	1.50
Steam Hose, 3-ply.....	.45	.54	.71	.90	1.07	1.24	1.41	1.74	.....
" 4 ".....	.54	.71	.88	1.10	1.31	1.52	1.74	2.18	.....
" 6 ".....	.81	1.07	1.32	1.65	1.96	2.28	2.61	3.27	.....
Suction Hose, on Brass Wire.....	.....	.77	1.00	1.25	1.65	2.10	2.50	3.10	4.00
Linen ".....	.....	.....	.20	.22	.25	.28	.30	.35	.50
" " Rubber Lined.....	.....	.....	.....	.50	.55	.....	.65	.75	.....
Cotton " " ".....	.....	.....	.....	.55	.60	.....	.70	.85	.....
" " Garden.....	.25	.30	.40	.....	.....	.....	.....	.....	.....

OAK TANNED LEATHER BELTING.



Width...inch	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4	$4\frac{1}{2}$	5
Per foot.....	.09	.12	.15	.18	.21	.24	.27	.30	.33	.36	.39	.42	.45	.51	.57
Width...inch	5 $\frac{1}{2}$	6	7	8	9	10	11	12	13	14	15	16	17	18	20
Per foot.....	.63	.69	.81	.93	1.05	1.17	1.29	1.41	1.53	1.65	1.80	1.94	2.10	2.26	2.58
Width.....inch	21	22	23	24	26	28	30	32	34	36	40	42	44	46	48
Per foot.....	2.74	2.90	3.06	3.22	3.56	3.90	4.22	4.54	4.86	5.18	5.82	7.10	8.40	10.00	12.00

Double Belts, twice the price of single.

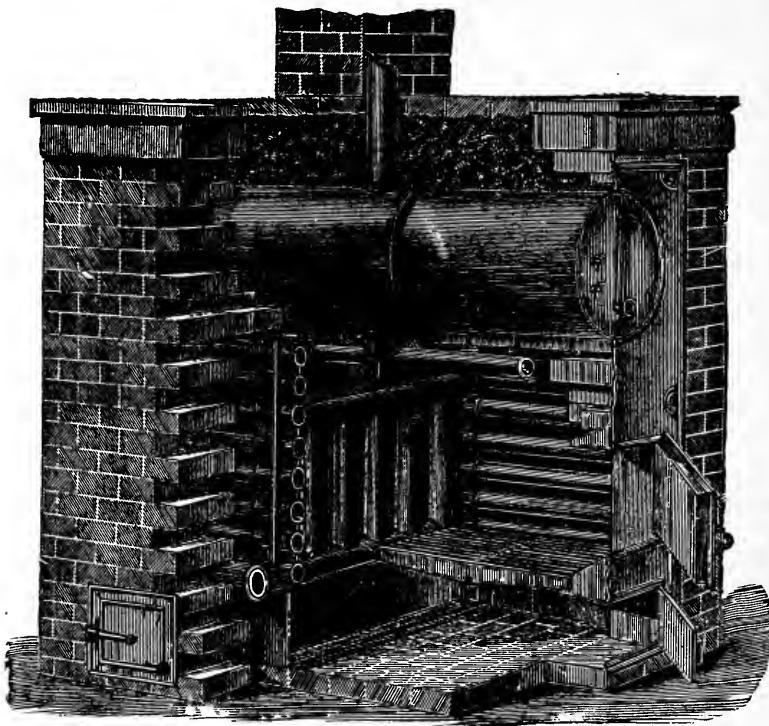
PACKINGS.

Tupper's Square Flax Packing.....	Per Pound.	.85
Seldon's Packing.....	"	.50
" with Rubber Core Packing.....	"	.60
" Square Braided.....	"	1.00
Peerless Piston, Composition Core Packing.....	"	.80
American "Plumbago," Hemp Core.....	"	.75
" " Rubber Core.....	"	1.00
Empire Rubber Core Packing.....	"	1.00
Phœnix "Hemp Core".....	"	.60
" Gum Core.....	"	1.00
" Cord for Globe Valves, $\frac{1}{16}$, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$	Per Spool.	.50
Manhattan (Black Lead) Packing.....	Per Pound.	1.00
Eagle " "	"	.25
Soapstone Packing.....	"	.20
Tuck's Square or Round Packing.....	"	.85
" with Rubber Back.....	"	1.00
Pure Gum.....	"	1.40
Asbestos Rope.....	"	.50
" Wick.....	"	.75
" Gaskets.....	"	.75
" Mill Board.....	"	.40
" Sheathing.....	"	.25
" Loose Fibre.....	"	.20
Cotton Packing.....	"	.20
" Wicking.....	"	.25
Italian Flax Packing.....	"	.30
" Hemp Packing.....	"	.17
American Hemp.....	"	.20
Mineral Wool.....	"	.05

SHEET PACKING.

Usudurian Sheet Packing.....	Per Pound.	.80
" Gaskets.....	"	1.00
Jenkins' Standard Packing.....	"	.80
Plumbago Sheet Packing.....	"	.80
Peerless " "	"	.80
Rubber " Cloth Insertion, $\frac{1}{16}$ and under.....	"	.65
" " $\frac{3}{32}$ " over.....	"	.55
" Gaskets for Man-Holes, all sizes.....	"	.80
Rubber Packing Gaskets, with cloth, both or one side, per schedule of ply, each cloth to count as one ply.....	"	....

NASON'S PATENT FREE-END TUBE STEAM BOILER.



The attention of the trade and the general public is respectfully called to our

CAST IRON SECTIONAL STEAM BOILER.

These are recommended as especially adapted to the warming of Dwellings and Public Institutions where low pressure steam is used, and they are offered with the assurance that they are in all respects superior to any other form of Boiler now known in this market for this class of work.

They are guaranteed safe, reliable, and durable.

Their manner of construction is as follows :

There is at the center of the boiler a cast-iron header so formed that, although cast in one piece, it is in effect a series of tubes which are connected together in the casting at the top and bottom.

This casting is the main portion of the boiler; into the top and sides of the front of it are screwed cast-iron tubes, about two and one-half inches in diameter, and of from eighteen to forty-two inches in length—depending upon the size of the boiler.

This form of construction gives a complete water lining to the fire box, thereby obviating the necessity of the use of any fire-brick in the setting. The main casting makes the rear of the fire-box, and the top and two sides are protected by the tubes above described.

NASON'S PATENT FREE-END TUBE STEAM BOILER—Continued.

Into the opposite side or back of the main casting are screwed a number of tubes of the same diameter as those on its front. There are as many tubes introduced as the space will admit of, in order to give the boiler large heating surface. These tubes are all closed at their outer ends with a plug; and a diaphragm is inserted in each to establish an active water circulation in them—using the same principle as that of our Vertical Tube Radiator.

This form of construction permits the tubes to freely expand and contract, thereby avoiding any tendency to breakage, which has hitherto been a defect in cast-iron boilers.

A horizontal cast or wrought iron dome is fastened to the top of the main casting, in which the water level of the boiler is maintained, ample provision being made for the separation of the steam and water.

The passage of fire and hot gases is through two square openings provided for this purpose in the top of the main casting, and thence down over the large body of tubes at its rear—the smoke being taken out through a flue at the side of the brick setting under the tubes.

This form of construction enables us to use a large amount of fire surface as compared with the size of the grates, thereby effecting an economy in the use of fuel hitherto not reached in boilers for domestic service, the proportion being 25 to 1, while that of ordinary small cast-iron boilers is not more than 15 feet of surface to each square foot of grate.

Each boiler is furnished with a substantial iron front, fire and ash pit doors, grate bars, bolts, and cleaning doors, steam and water gauges, gauge cocks, safety valve, and automatic damper for regulating the draft—the whole complete, ready for setting in brick work.

Easy access is had to all parts for cleaning. Any part can be duplicated.

They are convenient for shipping or transportation, and are readily put together.

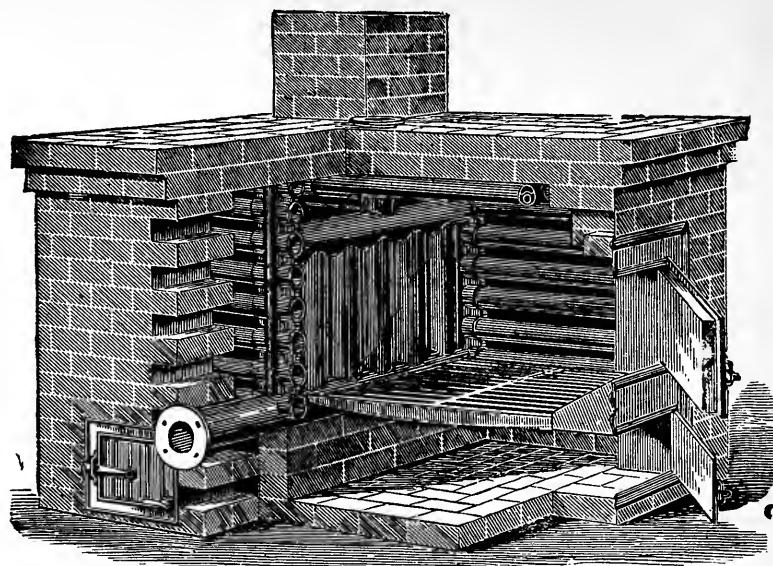
An ordinary workman will have no difficulty in putting one up.

They have been in use for 15 years past, and are to be found in many public and private buildings throughout the country.

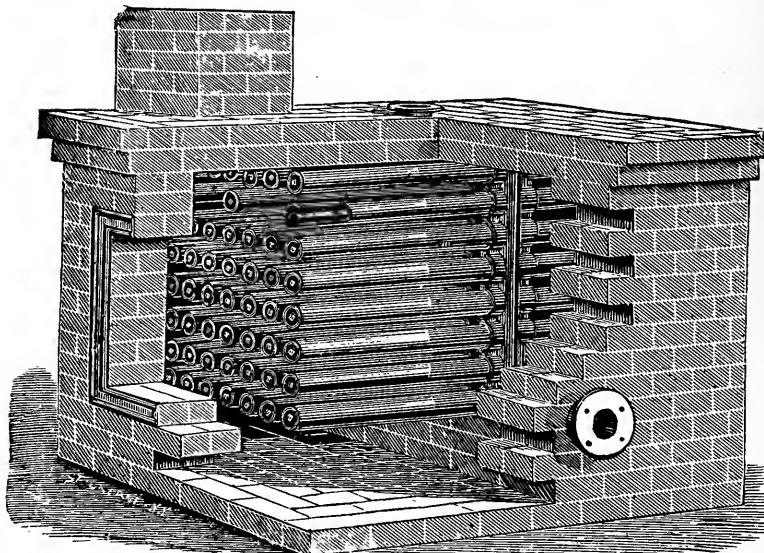
The following table contains fourteen of our standard sizes with prices appended. Larger sizes can be constructed to order.

References and testimonials furnished on application, if desired.

Number.....	1			2			3							
	2	2½	3	3½	4	4½	5	5½	6	6½	7	9	10	12
Square feet of Grate Surface.....	2	2½	3	3½	4	4½	5	5½	6	6½	7	9	10	12
Square feet of Boiler Surface exposed to the fire.....	55	65	78	83	105	116	131	140	158	168	182	225	250	300
Sq're ft. of Direct Radiating Surface which it will heat.	350	440	525	600	700	775	900	975	1050	1140	1225	1575	1750	2100
Price.....	235.	250.	285.	300.	310.	335.	340.	400.	415.	425.	450.	500.	575.	650.



Front view, showing Grate and Fire Door



Rear End, with Sweeping Door.

NASON FREE-END TUBE HOT WATER BOILER.

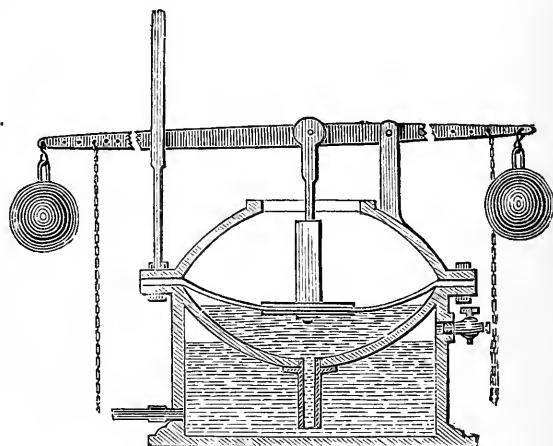
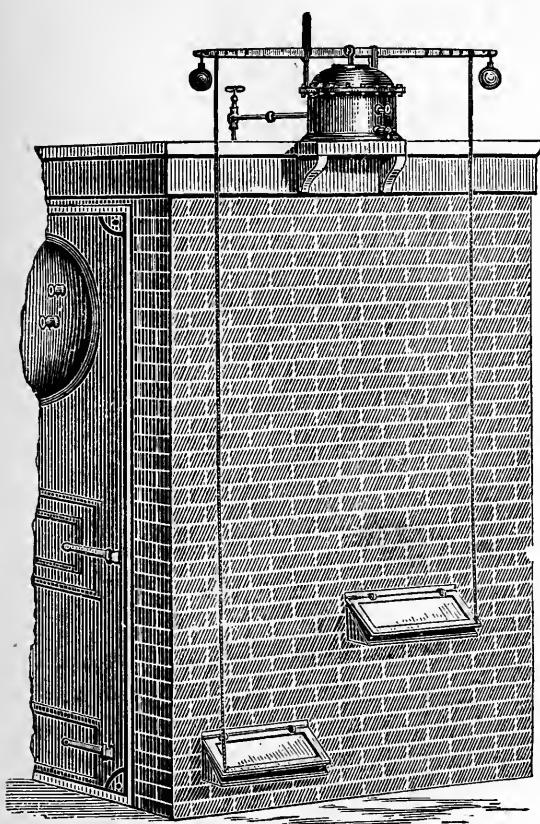
PATENTED 14TH JUNE, 1870.

A cast-iron Water Tube Boiler, furnished with a substantial iron front, with fire and ash-pit doors, grate bars, bolts, sweeping doors, and damper complete for setting in brick work.

Similar in general construction to Steam Boiler as described on pages 112 and 113.

Number	1		2					3			
	2	2½	3	3½	4	4½	5	5½	6	6½	7
Square feet of Grate Surface..	2	2½	3	3½	4	4½	5	5½	6	6½	7
Square feet of Boiler Surface exposed to the fire.	55	65	78	83	105	116	131	140	158	168	182
Square feet of Radiating Surface which it will heat.....	350	440	525	600	700	775	900	975	1050	1140	1225
Price \$.....	150	160	180	195	210	225	250	280	290	300	320

NASON'S DRAFT OR DAMPER REGULATORS.



FOR REGULATING DRAFTS IN LOW PRESSURE BOILERS.

In connection with Low Pressure Steam Warming Apparatus, there is a necessity for a Damper Regulator, which, while simple in construction, shall be so sensitive to slight variations of pressure as to control at all times the draft and maintain a suitable quantity of steam throughout the apparatus.

Our illustration shows a Regulator of this description, which has been devised to meet all the above requirements. The long lever is moved by a rubber diaphragm, to which it is connected, and against which the pressure from the boiler acts.

In order to prevent the steam from coming directly in contact with the rubber, a chamber is cast in the bottom of the Regulator which, by the condensation of steam, is kept filled with water, and through the tube, as shown in the illustration, the water is conducted to the upper portion of the Regulator, where it acts directly against the rubber.

It will be observed that by this device it is impossible for steam to come at any time against the diaphragm, thus protecting it from the destructive action which steam always exerts on rubber when in contact with it.

The diaphragm is made so large, having over fifty square inches of area, that a very slight variation of pressure produces a considerable movement of the lever, and the latter is so evenly balanced by weights that there is but little friction in connection with it.

Two doors are shown in the cut, one of which opens into the ash-pit, and the other over the fire; the latter is used to suddenly check the force of the fire when necessary, as, for instance, in a case where nearly all the Radiators in a house are shut at once.

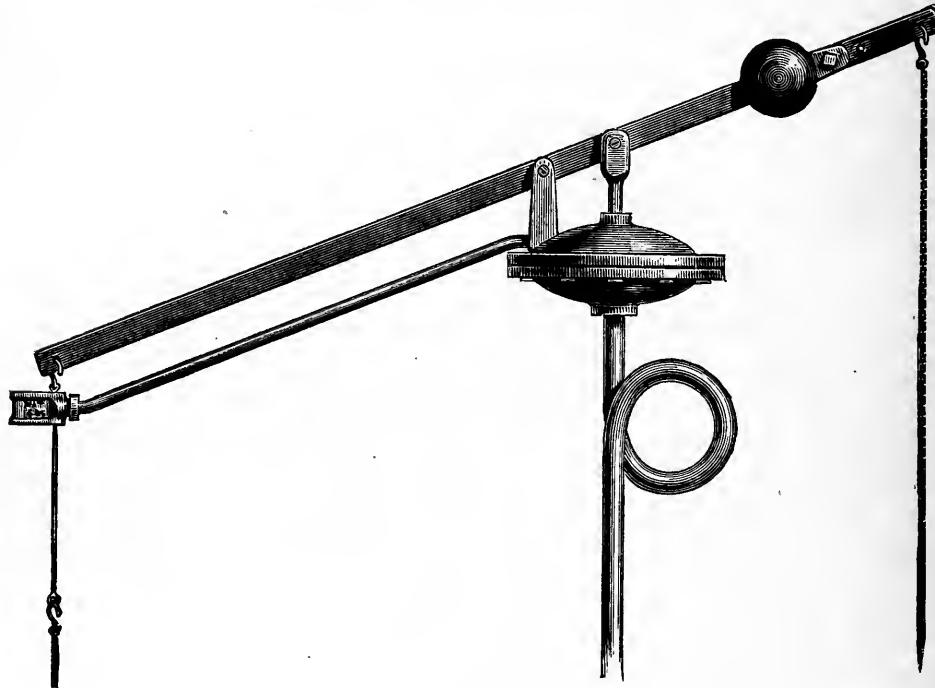
This arrangement renders the action of a steam apparatus entirely automatic as to the question of the regulation, the Boiler being as easy to attend as an ordinary Hot-Air Furnace, and no particular attention is necessary beyond the putting on of coal and cleaning of the fire from time to time.

PRICES:

Complete, with independent doors.....	15.00
Without doors.....	12.00

NASON'S DAMPER REGULATOR, WITH SAFETY ATTACHMENT.

PATENTED 2d MARCH, 1886.



Particular attention is called to the Safety Attachment to Apparatus for Automatic Draft Regulators, for which letters patent were granted March 2d, 1886.

By this device, should the diaphragm of the regulator be broken, the issuing steam will be directed upon a fusible link, connecting the draft damper with the lever; the damper will be released, and, closing, will completely check the draft.

As before constructed, the breaking of the diaphragm would open the damper to its full extent, greatly increasing the combustion, and at night, involving a dangerous degree of heat.

PRICES, WITH SAFETY ATTACHMENT.

Regulator, with 7 inch plates, including Gooseneck.....	.....	8.00
" " 9 " " " "	.....	12.00

NASON'S VERTICAL WROUGHT IRON WELDED TUBE RADIATORS.

The Nason Radiators have been so long and so favorably known as to render any very full description of their construction unnecessary, but certain improvements which have been recently adopted in their form and manufacture will prove interesting to the trade.

While retaining the original pattern of base and top for use where a heavy and massive appearance is desired, the general demand for a radiator combining elegance of form with strength, induced us to undertake the large labor and expense of making an entire new set of patterns, which design has to-day nearly supplanted the previous form. This pattern we have named Nason's IMPROVED, and radiators should be ordered under this name unless the old pattern is desired.

The most marked improvement is the form of the base, the latter being so constructed as to admit air through apertures between each of the pipes. These holes are circular, and made slightly conical in form, so that each is in fact a small blow pipe which directs a current of cold air, taken from the floor, where it is coldest, directly upon the adjacent pipes, and this enormously increases their activity in heating the air. By this device the inner rows of pipes are rendered almost as active as those on the exterior, and less heating surface than has been commonly used in the past can be employed in a room of given size.

By means of our recently patented welding process for closing the tops of tubes, a uniformity in their length and appearance is secured which is highly desirable; also absolute freedom from leakage is obtained. The process being done by machinery, all welds are subjected to precisely the same pressure.

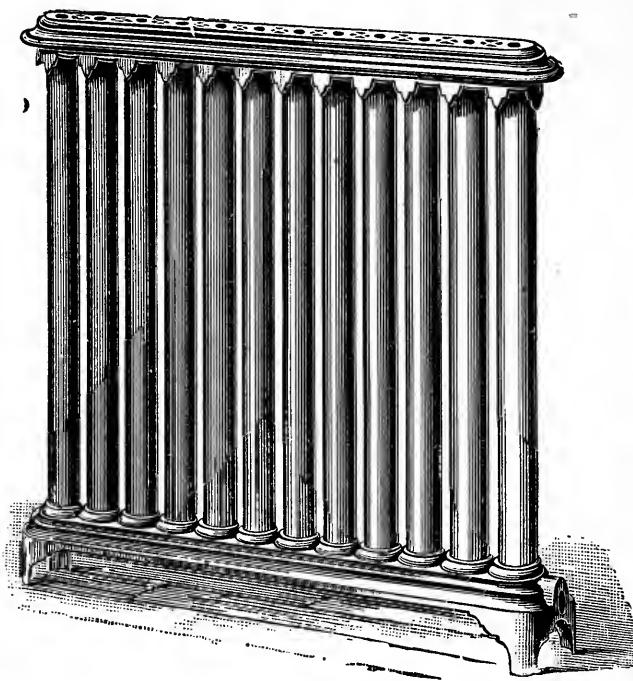
Attention is respectfully called to the carefully made series of experiments recently conducted by the well-known engineer and expert, Mr. George M. Barrus, of Boston, for the purpose of ascertaining the relative heating efficiency of our IMPROVED Radiator as compared with cast-iron surface.

An examination of the report of the test is interesting as showing not only the large percentage of heating efficiency in favor of our form, but that the Nason Radiator measures, $99\frac{1}{2}\%$ of one square foot, which is within an inappreciable fraction of the amount claimed for it, whereas cast-iron surface is offered and sold on the market, which is only $90\frac{1}{2}\%$ of what it is represented to be.

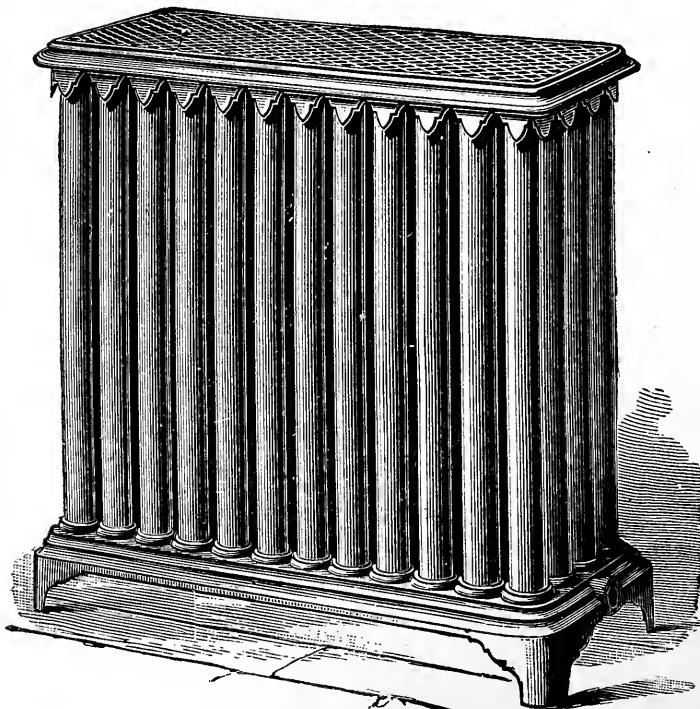
From the large number of sizes made, a few illustrations only are selected, which serves sufficiently to show their general style and appearance.

The annexed price-lists include only what are known as standard sizes, which are usually kept on hand, or if not on hand, can be promptly furnished. The prices include open work Iron Tops. Marble Tops will be furnished, at extra cost, when ordered, but as their use is attended with considerable loss of efficiency, they are not recommended except in special cases.

NASON'S "IMPROVED" VERTICAL WROUGHT IRON
WELDED TUBE RADIATORS.



Pattern No. 1. Single row of Tubes.



Pattern No. 4. Four rows of Tubes.

Each Tube guaranteed equal to one square foot of radiating surface.

NASON'S "IMPROVED" VERTICAL TUBE RADIATOR.

Pattern No. 1.—Single row of Tubes. Outside width, $4\frac{3}{4}$ inches; usual height, 36 inches:

Sizes of Steam Openings Inlets, $\frac{3}{4}$ inch. Outlets, 1 inch.
 Distances from centre of openings to the floor " 4 " " $3\frac{3}{4}$ "

Number of Tubes in length.....	4	6	8	10	12	16	20	24
Total number of Tubes.....	4	6	8	10	12	16	20	24
Outside length of Radiator..... inches	$10\frac{3}{4}$	15	$18\frac{3}{4}$	23	$26\frac{3}{4}$	$34\frac{3}{4}$	$42\frac{3}{4}$	$50\frac{3}{4}$
Square feet of heating surface.....	4	6	8	10	12	16	20	24
Price, plain.....	2.50	3.75	4.50	5.00	6.15	8.00	10.00	12.00
" Bronzed	3.00	4.50	5.50	6.00	7.50	9.50	12.00	14.00
Marble Top, extra, net.....	.75	1.00	1.25	1.50	1.50	2.00	2.50	2.75

Pattern No. 2.—Two rows of Tubes. Outside width, $6\frac{3}{4}$ inches; usual height, 36 inches:

Sizes of Steam Openings..... Inlets, 1 inch. Outlets, $1\frac{1}{4}$ inch.
 Distances from centre of openings to the floor " 4 " " $3\frac{3}{4}$ "

Number of Tubes in length.....	4	6	8	10	12	16	20	24
Total number of Tubes.....	8	12	16	20	24	32	40	48
Outside length of Radiator..... inches	$10\frac{3}{4}$	$14\frac{3}{4}$	$18\frac{3}{4}$	$22\frac{3}{4}$	$26\frac{3}{4}$	$34\frac{3}{4}$	$42\frac{3}{4}$	$50\frac{3}{4}$
Square feet of heating surface.....	8	12	16	20	24	32	40	48
Price, plain.....	4.25	6.50	7.50	9.00	11.00	15.00	18.00	21.00
" Bronzed	5.00	8.00	9.00	10.50	13.00	18.00	22.00	25.00
Marble Top, extra, net.....	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50

Pattern No. 3.—Three rows of Tubes. Outside width, $8\frac{3}{4}$ inches; usual height, 36 inches:

Sizes of Steam Openings..... Inlets, 1 inch. Outlets, $1\frac{1}{4}$ inch.
 Distances from centre of openings to the floor " 4 " " $3\frac{3}{4}$ "

Number of Tubes in length.....	4	8	12	16	20	24	28
Total number of Tubes.....	12	24	36	48	60	72	84
Outside length of Radiator..... inches	$10\frac{3}{4}$	$18\frac{3}{4}$	$26\frac{1}{2}$	$34\frac{3}{4}$	$42\frac{3}{4}$	$50\frac{3}{4}$	$58\frac{3}{4}$
Square feet of heating surface.....	12	24	36	48	60	72	84
Price, plain.....	6.00	11.00	16.00	21.00	26.00	31.00	36.00
" Bronzed	7.00	12.50	18.50	24.00	30.00	36.00	42.00
Marble Top, extra, net.....	1.25	2.00	2.75	3.50	4.00	5.00	6.00

Pattern No. 4.—Four rows of Tubes. Outside width, $10\frac{3}{4}$ inches; usual height, 36 inches:

Sizes of Steam Openings..... Inlets, 1 inch. Outlets, $1\frac{1}{4}$ inch.
 Distances from centre of openings to the floor " 4 " " $3\frac{3}{4}$ "

Number of Tubes in length.....	4	8	12	16	20	24	28	32
Total number of Tubes.....	16	32	48	64	80	96	112	128
Outside length of Radiators..... inches	$10\frac{3}{4}$	$18\frac{3}{4}$	$26\frac{3}{4}$	$34\frac{3}{4}$	$42\frac{3}{4}$	$50\frac{3}{4}$	$58\frac{3}{4}$	$66\frac{3}{4}$
Square feet of heating surface.....	16	32	48	64	80	96	112	128
Price, plain.....	7.50	13.50	20.50	26.50	33.00	39.00	45.50	52.50
" Bronzed	8.50	16.00	24.00	31.00	38.50	46.00	53.50	62.00
Marble Top, extra, net	2.00	3.00	3.60	4.50	5.50	6.50	7.50	8.50

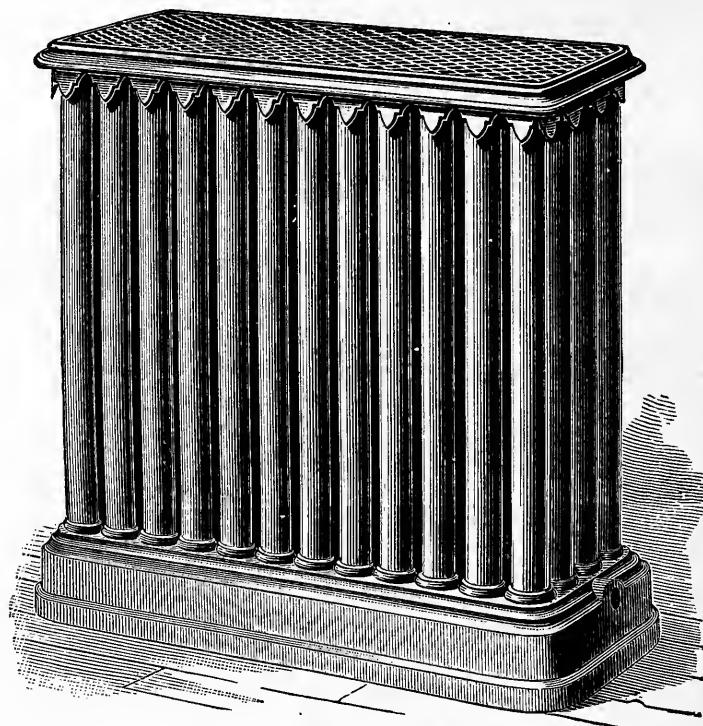
Tennessee Marble Tops, double prices as above, net.

It will be noticed that the Outlets to Radiators in the foregoing tables are larger than the Inlets. They are made thus because when intended for single pipe connection the Outlets, being the lower, they can be tapped larger for the purpose of admitting steam and taking the water of condensation through the same pipe. *When otherwise intended, both Inlets and Outlets will be tapped as ordered.*

These Radiators are considerably more efficient than those made of cast iron. This must be so, since wrought iron is the best surface in use for steam warming radiation.

NASON'S "BOX BASE" PATTERN.

VERTICAL WROUGHT IRON WELDED TUBE RADIATOR.



This form of base affords the best possible method of admitting air to rooms on the direct-indirect system, which is becoming deservedly popular, as owing to the large number of openings equally distributed in the base, no air can enter without coming immediately in contact with every part of the heating surface, thus becoming at once and thoroughly warmed. Each tube thus does its full share of work, and contributes greatly to the heating efficiency of the radiator.

The dimensions, &c., are identical with those of our new pattern as described on page 117.

Pattern No. 1. Single Row of Tubes—

No. of Tubes in Length,	4	8	12	16	20	24
Total No. of Tubes,	4	8	12	16	20	24
Price for plain,	2.75	5.00	8.25	10.50	12.00	13.50
Price for bronzed,	3.25	6.50	9.75	12.00	14.00	15.50

Pattern No. 2. Double Row of Tubes—

No. of Tubes in Length,	4	8	12	16	20	24
Total No. of Tubes,	8	16	24	32	40	48
Price for plain,	4.50	8.00	11.75	16.00	20.00	23.50
Price for bronzed,	5.25	9.50	13.75	19.00	24.00	27.50

Pattern No. 3. Three Rows of Tubes—

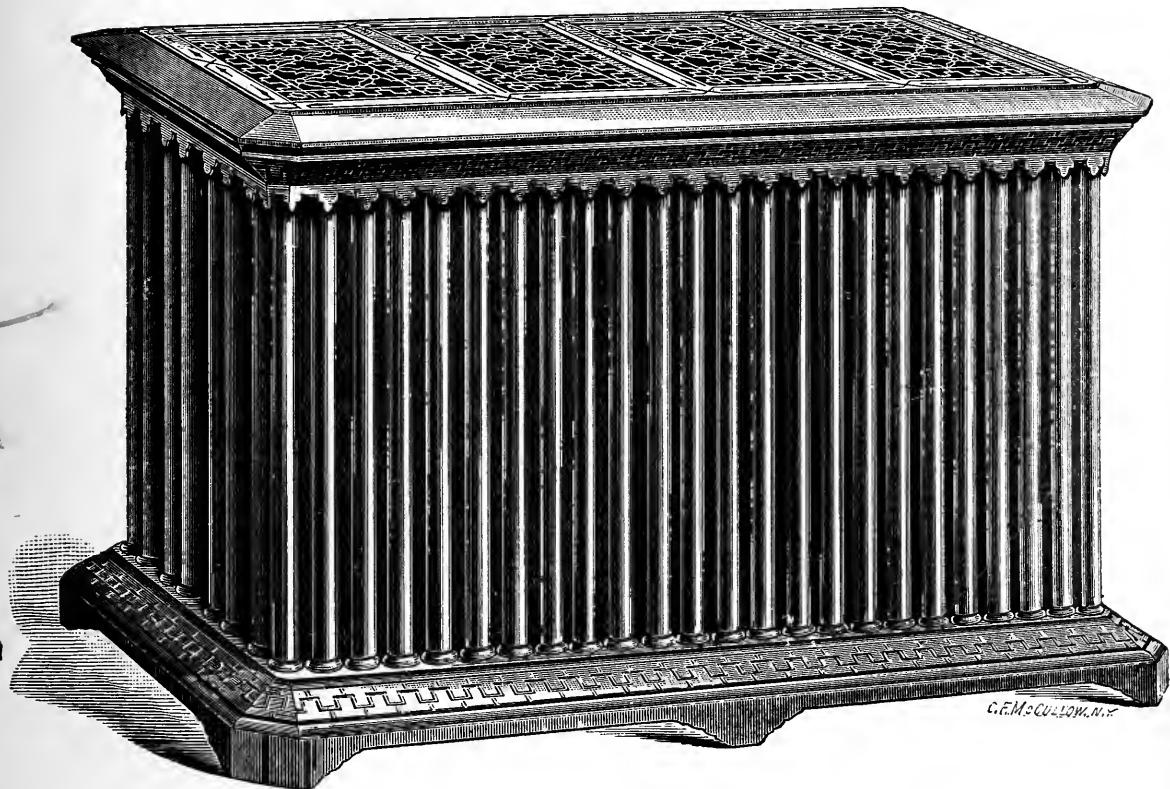
No. of Tubes in Length,	4	8	12	16	20	24	28
Total No. of Tubes,	12	24	36	48	60	72	84
Price for plain,	6.40	11.80	17.25	21.50	29.50	34.75	40.50
Price for bronzed,	7.40	13.25	19.75	25.50	33.00	39.25	46.00

Pattern No. 4. Four Rows of Tubes—

No. of Tubes in Length,	4	8	12	16	20	24	28	32
Total No. of Tubes,	16	32	48	64	80	96	112	128
Price for plain,	8.00	14.50	25.00	28.50	37.00	43.50	51.00	58.00
Price for bronzed,	9.00	16.00	27.50	33.50	42.50	50.00	58.00	68.00

NASON'S "DUPLEX" PATTERN. 1885.

VERTICAL WROUGHT IRON WELDED TUBE RADIATOR.



Size 8 Tubes x 24, 192 Tubes, equal to 192 Square Feet of Surface.

Outside Dimensions, Length 4 ft., 5 1/2 in., Width 24 1/2 in.

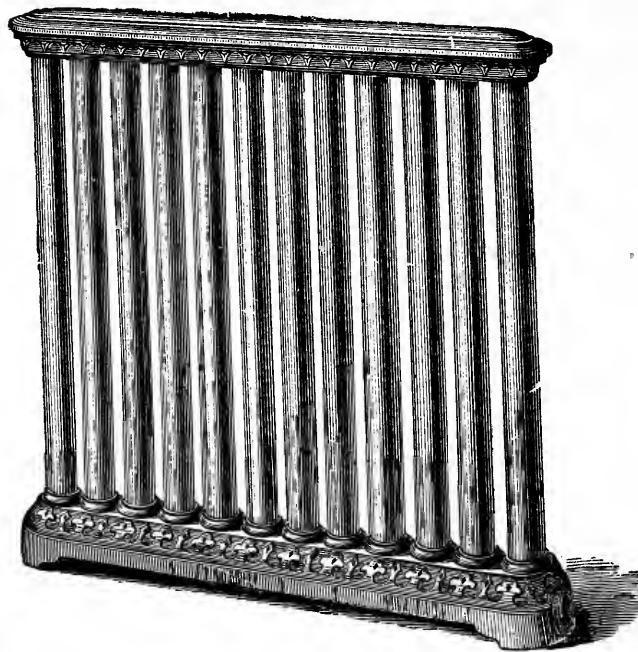
To our large assortment of RADIATOR PATTERNS we have recently added the size shown above to meet an increasing demand for a Radiator which, while having a larger amount of heating surface, would occupy comparatively little floor area.

There are so many instances in which this is desirable, that the immediate popularity of the radiator is assured. It will be observed from the cut that the rows of tubes are arranged in groups of two, thus leaving a large provision for admitting air up through openings in the base, and rendering the inside rows of tubes nearly as efficient as those on the exterior.

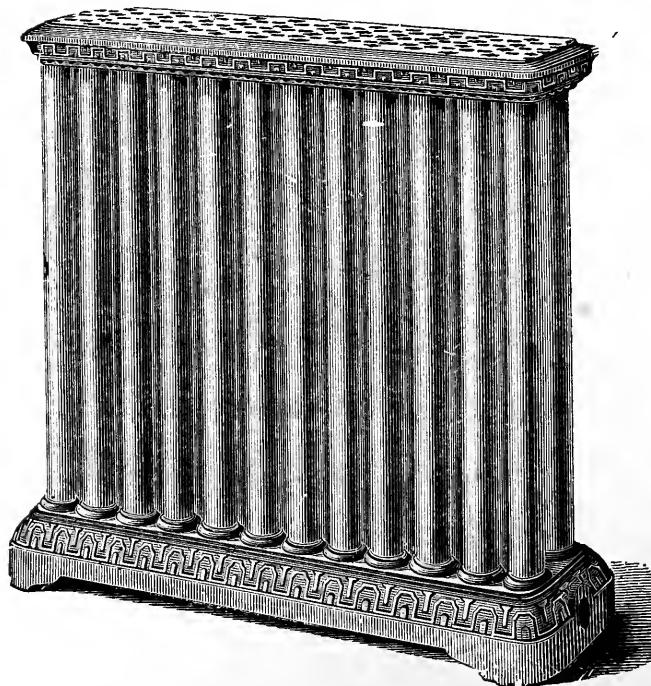
A stock of these, both plain and bronzed, is carried, from which immediate shipments can be made.

Price, plain.....	95.00
“ bronzed.....	110.00
Marble Top, extra, net	15.00

NASON'S "STANDARD" PATTERN WROUGHT IRON
WELDED TUBE RADIATOR.



Pattern No. 1. Single Row of Tubes, made in 8 sizes.



Pattern No. 2. Two Rows of Tubes, made in 8 sizes.

NASON'S "STANDARD" PATTERN.

VERTICAL WROUGHT IRON WELDED TUBE RADIATORS.

These are similar in construction to the new pattern described in the previous pages, except that they are heavier and more substantial in appearance, also more elaborate in design.

In handsomely furnished dwelling houses they are frequently used where a radiator of extra finish is desired.

As in the case of the new pattern, each tube is guaranteed to equal one square foot of surface.

PATTERN No. 1. SINGLE ROW OF TUBES.

STANDARD SIZES.

Outside width, 4 inches. Usual height, 3 feet.

Sizes of Steam Openings—Inlets, $\frac{3}{4}$ inch. Outlets, 1 inch.

Distances from centre of openings to the floor—Inlets, 3 inches. Outlets, $2\frac{1}{2}$ inches.

No. of Tubes in Length.	Total No. of Tubes.	Square feet of Radiating Surface.	Outside length, inches	Price for Plain.	Price for Bronzed.	Marble Top, Extra, Net.
4	4	4	10	3.25	3.75	.75
6	6	6	15	4.50	5.00	1.00
8	8	8	18	5.25	6.00	1.25
10	10	10	23	6.50	7.25	1.50
12	12	12	26	7.25	8.25	1.50
16	16	16	34	9.25	10.50	2.00
20	20	20	42	11.00	12.50	2.50
24	24	24	50	13.50	15.00	2.75

PATTERN No. 2. DOUBLE ROW OF TUBES.

Outside width, $6\frac{3}{4}$ inches. Usual height, 3 feet.

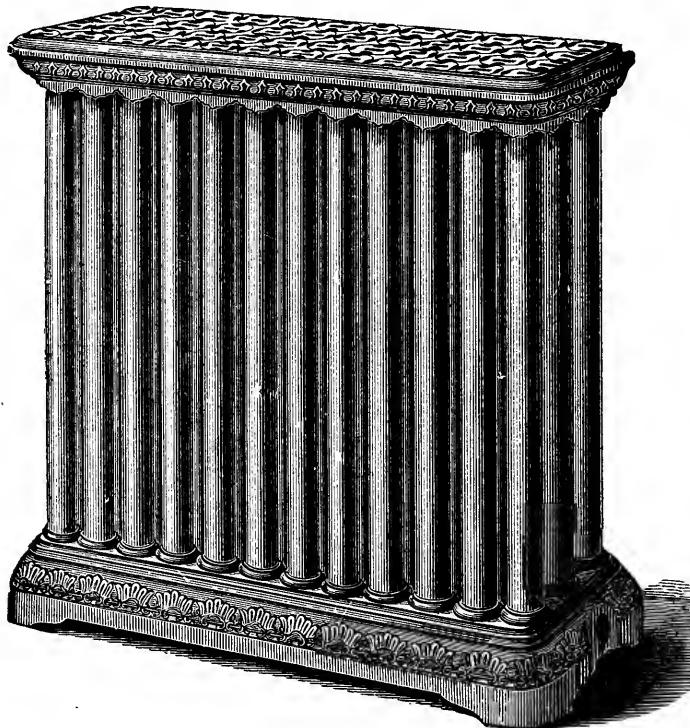
Sizes of Steam Openings—Inlets, 1 inch. Outlets, $1\frac{1}{4}$ inches.

Distances from centre of openings to the floor—Inlets, 4 inches. Outlets, $3\frac{1}{8}$ inches.

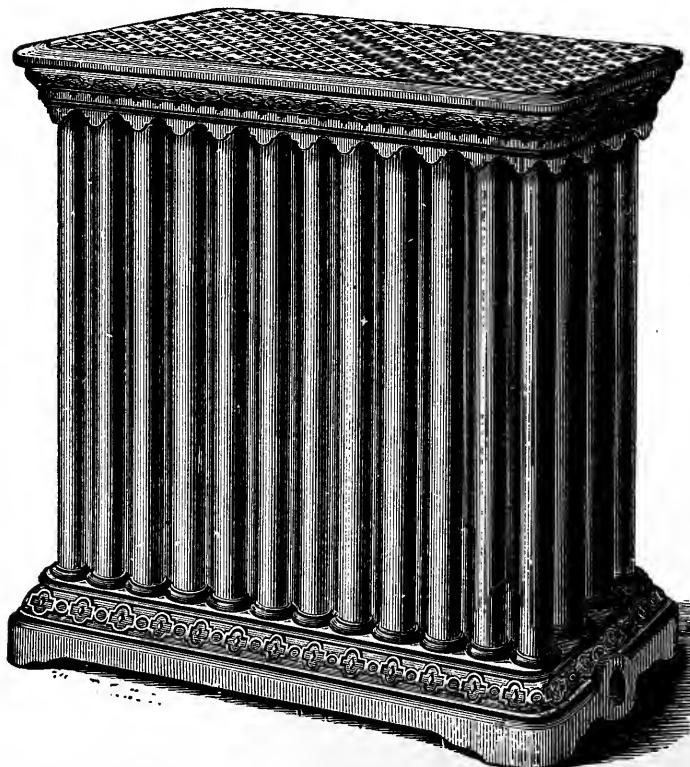
No. of Tubes in Length.	Total No. of Tubes.	Square feet of Radiating Surface.	Outside length, inches	Price for Plain.	Price for Bronzed.	Marble Top, Extra, Net.
4	8	8	11	5.25	6.00	1.00
6	12	12	14	8.00	9.00	1.25
8	16	16	18	9.20	10.50	1.50
10	20	20	23	10.75	12.50	1.75
12	24	24	27	13.15	15.00	2.00
16	32	32	33	17.00	19.50	2.50
20	40	40	43	20.50	23.50	3.00
24	48	48	51	25.00	28.50	3.50

NASON'S "STANDARD" PATTERN.

WROUGHT IRON WELDED TUBE RADIATOR.



Pattern No. 3. 3 Rows of Tubes, made in 7 sizes.



Pattern No. 4. 4 Rows of Tubes, made in 8 sizes.

NASON'S "STANDARD" PATTERN.

VERTICAL WROUGHT IRON WELDED TUBE RADIATORS.

PATTERN No. 3. THREE ROWS OF TUBES.

Outside width, 9 $\frac{1}{4}$ inches. Usual height, 3 feet.Sizes of Steam Openings. Inlets, 1 inch. Outlets, 1 $\frac{1}{4}$ inch.Distances from centre of openings to the floor—Inlets, 4 $\frac{1}{2}$ inches. Outlets, 3 $\frac{1}{2}$ inches.

No. of Tubes in Length.	Total No. of Tubes.	Square Feet of Radiating Surface.	Outside Length. Inches.	Price for Plain.	Price for Bronzed.	Marble Tops, Extra, Net.
4	12	12	11	7.75	8.75	1.25
8	24	24	19	13.50	15.50	2.00
12	36	36	27	19.25	22.00	2.75
16	48	48	33	25.00	28.50	3.50
20	60	60	43	32.00	36.50	4.00
24	72	72	51	37.50	42.50	5.00
28	84	84	59	42.50	48.50	6.00

PATTERN No. 4. FOUR ROWS OF TUBES.

Outside width, 12 inches. Usual height, 3 feet.

Sizes of Steam Openings. Inlets, 1 inch. Outlets, 1 $\frac{1}{4}$ inch.Distances from centre of openings to the floor—Inlets, 4 $\frac{3}{4}$ inches. Outlets, 3 $\frac{1}{8}$ inches.

No. of Tubes in Length.	Total No. of Tubes.	Square Feet of Radiating Surface.	Outside Length. Inches.	Price for Plain.	Price for Bronzed.	Marble Tops, Extra, Net.
4	16	16	12	10.50	12.00	2.00
8	32	32	20	18.25	21.00	3.00
12	48	48	28	27.00	31.00	3.60
16	64	64	36	34.50	40.00	4.50
20	80	80	44	43.00	50.00	5.50
24	96	96	52	50.50	58.00	6.50
28	112	112	60	57.50	65.00	7.50
32	128	128	68	65.00	74.00	8.50

The Inlets and Outlets, if not wanted as above named, will be made as desired.

NASON'S "STANDARD" PATTERN.

VERTICAL WROUGHT IRON WELDED TUBE RADIATORS.



CIRCULAR PATTERN.

USUAL HEIGHT, ABOUT THREE FEET.

Distances from centre of openings to the floor Inlets, $4\frac{1}{2}$ inches. Outlets, 4 inches.

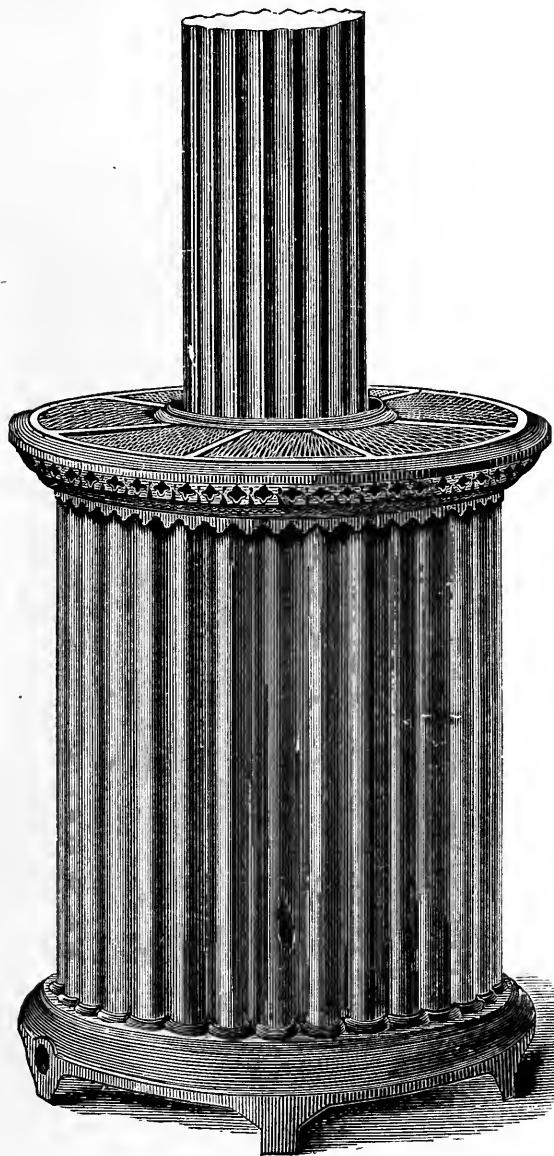
Number.	No. of Tubes.	Square Feet of Radiating Surface.	Outside Diameters. Inches.	Inlets. Inches.	Outlets. Inches.	Price for Plain.	Price for Bronzed.	Marble Tops, Extra, Net.
1	18	18	12	$\frac{3}{4}$	$1\frac{1}{4}$	11.00	12.25	1.75
2	30	30	18	$\frac{3}{4}$	$1\frac{1}{4}$	17.00	19.00	2.50
3	54	54	$20\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{4}$	28.50	32.00	4.00
4	72	72	25	1	$1\frac{1}{4}$	35.50	40.50	5.00
5	102	102	$33\frac{1}{2}$	1	$1\frac{1}{4}$	54.50	62.00	8.00
6	130	130	38	$1\frac{1}{4}$	$1\frac{1}{4}$	67.00	76.00	10.00
7	160	160	38	$1\frac{1}{4}$	$1\frac{1}{4}$	80.00	91.00	11.00

The heating capacity and the cost of Circular Radiators may be varied by leaving out any number of Tubes, except the outer row, without changing the external appearance.

The Inlets and Outlets will be made as ordered.

NASON'S "STANDARD" PATTERN.

VERTICAL WROUGHT IRON WELDED TUBE RADIATORS.



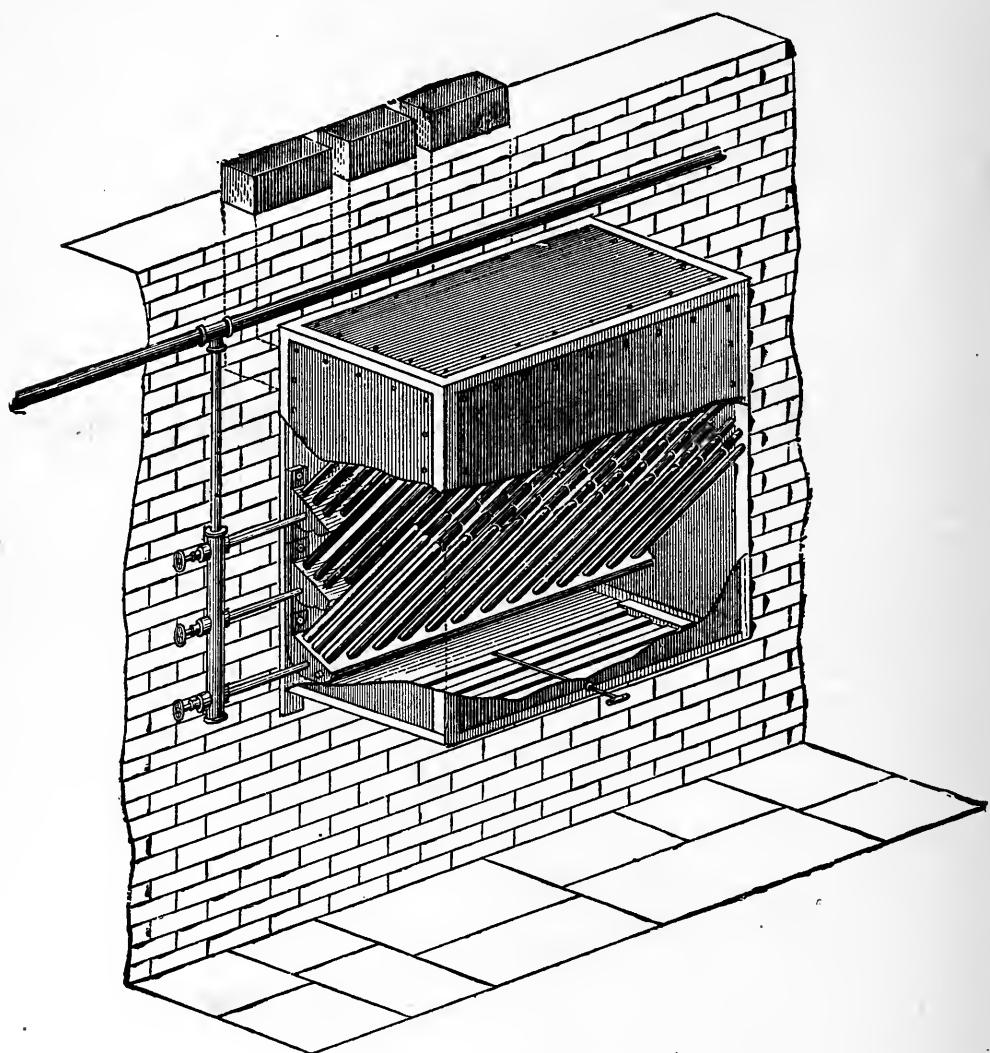
COLUMN RADIATORS.

Made in halves to encircle columns. Made in five sizes. Usual height, 3 feet.

Distances from centre of openings to the floor—Inlets $4\frac{1}{2}$ inches, Outlets 4 inches.

No.	No. of Tubes	Square feet of Radiating Surface.	Outside Diameters—Inches.	Inlets.	Outlets.	Diameter of Opening in the Base—Inches.	Price for Plain.	Price for Bronzed.	Marble Top Extra, Net.
1	58	58	$26\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{4}$	12	33.00	37.00	7.00
2	80	80	$28\frac{1}{2}$	1	$1\frac{1}{4}$	12	43.00	48.50	8.00
3	102	102	$33\frac{1}{2}$	1	$1\frac{1}{4}$	16	57.00	64.00	9.50
4	130	130	38	$1\frac{1}{4}$	$1\frac{1}{4}$	16	72.00	81.00	10.00
5	160	160	38	$1\frac{1}{4}$	$1\frac{1}{4}$	16	85.00	96.00	10.00

NASON'S INDIRECT RADIATORS.



SIMILAR IN GENERAL CONSTRUCTION TO OUR DIRECT WROUGHT IRON WELDED¹ TUBE RADIATORS, FOR HOSPITALS, CHURCHES, DWELLINGS, ETC.

This form of surface is offered as an improved substitute for the various kinds of radiators which have hitherto been in use, and its many advantages over them, and also the old form of box coils, will, upon examination, be readily appreciated.

The construction of the Radiator is, in its general features, the same as that of our well known Direct Radiator, consisting of an open base, into the top of which the radiating tubes are screwed—steam circulation in the latter being induced by the introduction of a sheet-iron diaphragm into each.

The Radiators are suspended against the wall beneath the flues by means of lugs cast on the backs of the bases; and the readiness with which they can be placed in position is an important feature in their favor.

NASON'S INDIRECT RADIATORS.—Continued.

As shown in the cut, the tubes are inclined at a considerable angle, which, while it does not interfere with the circulation of the steam in the tubes, nor prevent the prompt escape of the condensed water, insures a positive contact with all the air to be warmed on its way to the flues.

An important advantage is the manner in which the surface may be sub-divided, and one, two, or three sections used at pleasure, depending upon the severity of the weather.

Special branch tees or manifolds, with valves, are made, as shown in the cut, and can be furnished, when ordered.

Special prices will also be named for casings, depending upon the dimensions and number of radiators to be used.

Among the many advantages possessed by them may be enumerated the following:

The base being entirely open and free from obstructions in the shape of diaphragms, ribs, etc., steam will circulate under a minimum pressure; and there being no pockets for the possible accumulation of water, no noise can occur in the radiators; and in the event of freezing, no damage can result. In this particular the advantage over the old form of box coil is important.

The small space occupied is often a consideration in a cellar where the room is restricted. With this Radiator more effective surface is contained in less compass than with any other made.

All Radiators are tested under a pressure of 75 pounds, both with cold water and with steam, insuring a certainty that no leaks will occur, and that in cases where high pressure steam is used, freedom from accident is assured.

The low price at which these Radiators are offered competes very favorably both with box coils and the other devices used for this service, and should commend itself to all contractors having work in hand for indirect steam apparatus.

Price per Tube (without casing).....50 cents.

SCREENS FOR VERTICAL TUBE RADIATORS.

POLISHED BRASS OR ANTIQUE FINISH.

Objections are occasionally made to Steam Radiators, that they are not sufficiently ornamental in comparison with highly finished furniture. To obviate this, we offer the following very handsome designs of Screen Coverings, made with Polished Brass or Antique Finish.

They are made in any sizes to order, either round, square or oblong, and can be placed on any radiator in use, old or new, before or after setting.



No. 1.—Each, 10.50.



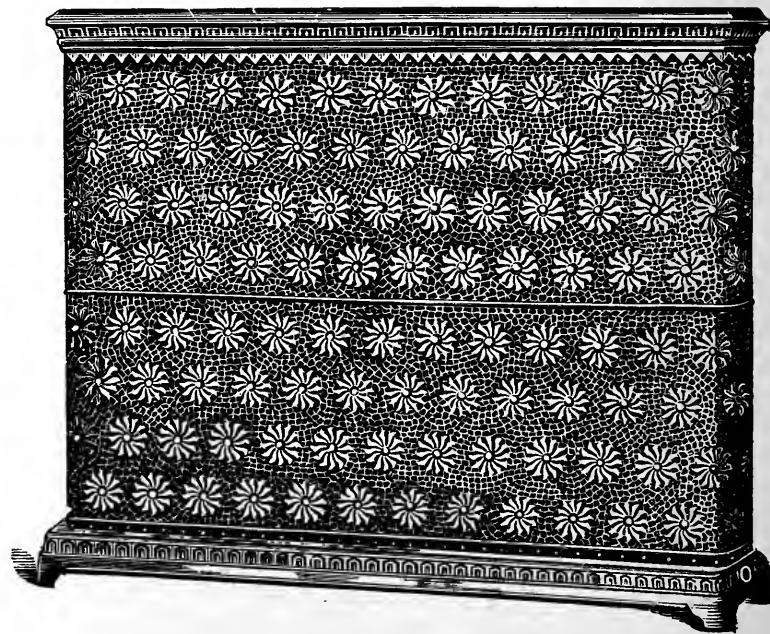
No. 2.—Each, 13.00.



No. 3.—Each, 16.50.

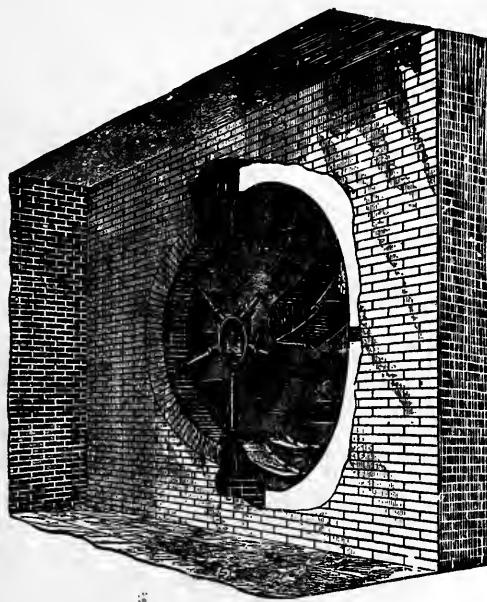


No. 4.—Each, 14.50.



No. 6 Screen.—Each, 25.00.

NASON'S IMPROVED CENTRIFUGAL FANS.



FOR VENTILATING HOSPITALS, ASYLUMS, HOTELS, SCHOOLS, CHURCHES,
PUBLIC BUILDINGS AND MINES.

These Fans are designed for use in such cases as it is desirable to deliver large quantities of air against a small resistance of pressure.

By their peculiar form of construction the most economical results are obtained, and a minimum of power only is necessary. Experiments conducted with great care, with a view to ascertaining what amount of economy was practicable, developed the fact that 70 per cent. of the power applied was utilized in the movement of the current of air.

Being constructed entirely of iron, the fans run with great accuracy, and are not liable to get out of shape, as commonly occurs when wood is partially used, and as they are put together in sections of small size, they can be readily packed for shipment.

This form, moreover, is such that they are perfectly noiseless, even when driven at the highest velocity named in the table, a feature that will be appreciated in hospitals or other buildings occupied by invalids or patients.

With each fan is furnished a pulley of suitable size, and a length of shafting not exceeding 10 feet.

A strong iron framework for building into the masonry, as shown in the cut, and the bearings which are of Babbitt metal, are also sent.

Diameter of Fan.	Usual Number of Revolutions per Minute.	Cubic Feet of Air per Minute when Discharging against Resistance of Flues.	Proper Area of Ducts for each Size, in Square Feet.	Price.
5 Feet	200 to 350	7,000 to 12,000	7½	220.00
6 "	160 to 300	10,000 to 18,000	11	280.00
7 "	140 to 240	15,000 to 28,000	15	310.00
10 "	100 to 175	28,000 to 50,000	30	405.00
12 "	80 to 150	50,000 to 75,000	45	500.00
14 "	70 to 125	55,000 to 100,000	60	655.00
16 "	55 to 105	75,000 to 130,000	80	875.00

NASON'S PATENT STEAM TRAP.

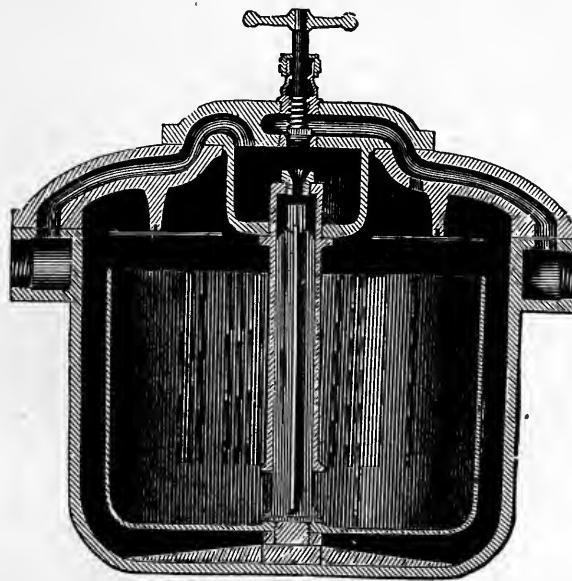


FOR TAKING OFF THE WATER OF CONDENSATION FROM STEAM PIPES, COILS,
AND APPARATUS EMPLOYED IN STEAM HEATING AND EVAPORATING;
ALSO LARGELY USED IN SUGAR HOUSES AND BREWERIES.

It is essential to the efficient and continuous working of a Steam Heating Apparatus, that the water of condensation should be either returned directly to the boiler, or constantly withdrawn by the aid of some device, which, while allowing the free discharge of water, will prevent the escape or loss of steam. Such a device is commonly known as a *Steam Trap*, and the cases where its use can be dispensed with are so exceptional that it has become an indispensable attachment to nearly every form of Steam Heating and Evaporating Apparatus.

The Steam Traps manufactured by the NASON MANUFACTURING Co. have always enjoyed the reputation of being the best of their kind—more extensively known and used than any other—in fact, the standard of excellence with Steam Fitters and Engineers in all parts of the country.

The particular improvements, to which we now call attention, and which have been secured by Letters Patent, have been suggested by long practical experience and familiarity with the liabilities to derangement to which Steam Traps are peculiarly exposed.



These improvements, which are shown in the sectional cut, consist, first, in placing the Float Valve and its attachments near the top of the Float, where they are removed as far as possible from the refuse matters, such as bits of red lead, hemp, rubber, scales, etc., which become detached from the Steam Pipes and Coils, and find their way into the Steam Trap; and, second, in providing the larger sizes with a small Cover or Hand Hole, which may be readily detached for the purpose of inspecting the working parts, or removing obstructions, thus avoiding the usual and tedious alternative of taking off the whole top.

In the manufacture of the Improved Steam Traps, the same care will be observed, as heretofore, in regard to materials, workmanship and adjustment. They will be fully tested before leaving the factory, and warranted to operate well, if properly applied.

The following table shows the number of square feet of heating surface in a common high-pressure Steam Heating Apparatus, which Steam Traps of the several sizes may be expected to drain under ordinary exposure to cooling. For very low pressures, either a large size should be used, or a Steam Trap should be specially ordered, with enlarged valve opening.

Number of Steam Trap	1	2	3	4	5
Size of Pipe Connections.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Diameter of Cylinder....."	8	$10\frac{1}{2}$	12	14	18
Height to top of Cover	8	10	12	14	$15\frac{1}{2}$
Greater number of square feet of surface to which it should be applied.....	350	900	1,400	2,000	3,500
Price	16.00	20.00	27.50	35.00	65.00

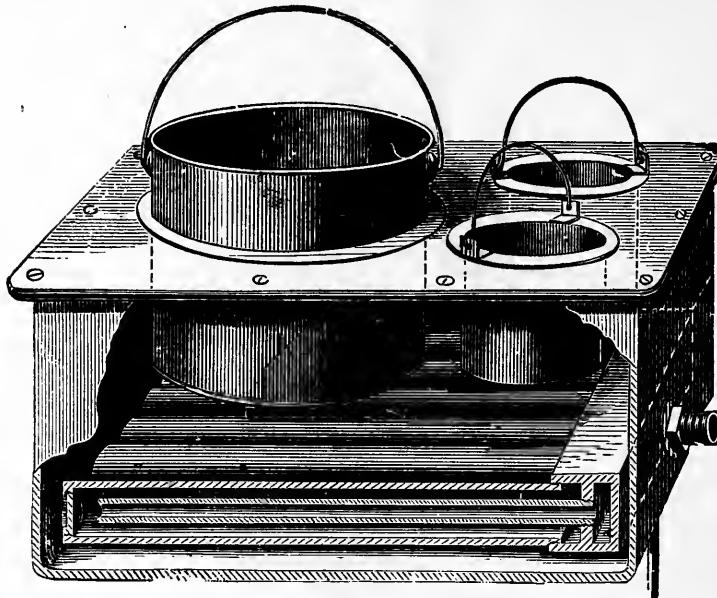
These numbers and sizes do not correspond with those of the Steam Traps heretofore manufactured by us. To prevent mistakes, therefore, in ordering from this list, it should be stated that the numbers designated refer to *Patent Steam Traps*.

As a large assortment of the various sizes is kept on hand, orders will always be filled without delay.

IMPROVED STEAM TRAP, especially designed for LOW PRESSURE, \$16.00 each.

NASON'S STEAM HEATER.

FOR GLUE, PASTE, ETC.



As shown above, the heater consists of a cast-iron box with cover, in which there are holes of suitable size to receive such pots as may be desired.

The heating surface consists of horizontal tubes screwed into a header, each of which has a smaller tube within it through which the steam enters, and a positive circulation—even under low pressure—is insured.

Exhaust steam being frequently used for heating purposes, the tubular form of the heating surface gives abundant heating area, and its efficiency is so greatly increased thereby that as good results are reached as if high pressure steam were connected to the heater.

Three sizes are made, numbered 1, 2 and 3, and below will be found a list of the regular sizes and number of pots which are commonly made for each heater.

Extra pots of the several sizes and materials are kept in stock and can be furnished as wanted.

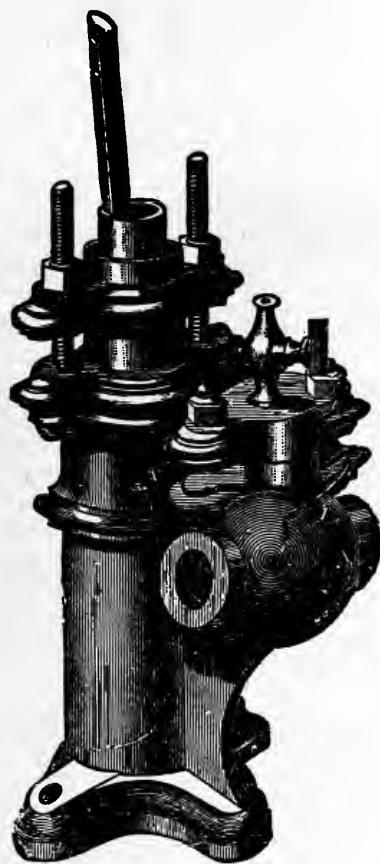
Numbers.....	1	2	3
Sizes and Numbers of pots fitted up for each size.....	Two 5 in. or, One 8 in. or, One 9 in.	Six 5 in. Or, One 10 in. and, Two 5 in.	Two 12 in. or, One 12 in. and, Four 5 in. or, Eight 5 in.
Price without pots.....	8.00	16.00	20.00

COPPER POTS FOR GLUE HEATERS.

Diameter, inches.....	5	8	9	10	12
Depth, inches.....	5 2.00	7½ 3.50	7½ 4.00	8 4.50	8 5.50

Galvanized Cast-Iron Pots, 5 inch, 75 cents each.

NASON'S BOILER FEED PUMP.



The above cut represents our Special Pump for boiler feeding, and for raising water, when desired, against high pressures.

It is to be driven by a crank, and by placing the driving pin, to which the pump rod is connected, at a greater or lesser distance from the centre of the shaft, the quantity per minute can be regulated to a nicety.

The pump is of the plunger pattern, the rod going down into the inside of the plunger, and it is connected at the bottom of it by means of a ball joint, which admits of free motion in all directions, thus reducing any wear on the surface of the plunger to a minimum.

It will be noticed that the gland and stuffing box are made of very liberal size, with a large movement for the follower, so that the pump requires but little attention to the packing; and it will never be found necessary to screw the follower down hard.

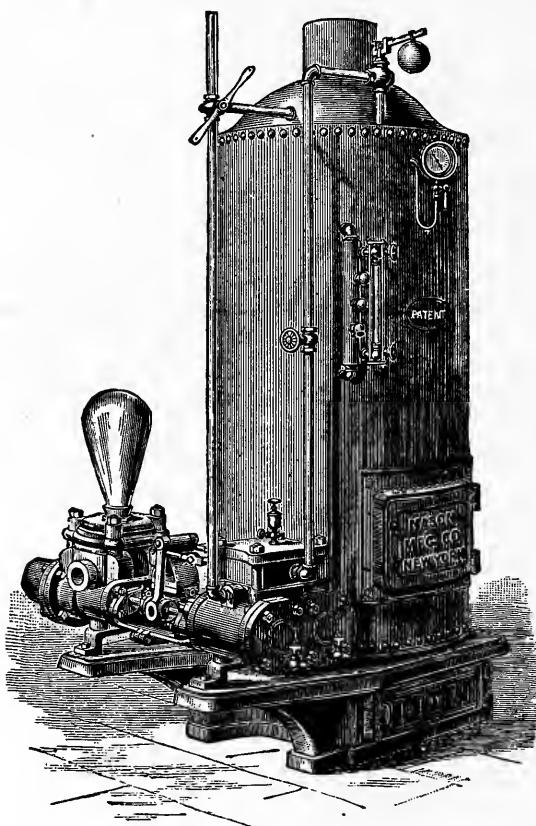
One of the most important features is the valve chamber, which is so arranged that both inlet and outlet valves are placed within it, one being above the other, and both can be taken out at a moment's notice by simply removing the small valve chest cover, which will be noticed in the cut just under the air cock.

The pump is constructed throughout of the best materials, and is put together in regular machine shop fashion—all joints being planed or turned, and the pump will work satisfactorily under 250 pounds pressure.

STANDARD SIZES AND PRICES.

Diameter of Plunger, inches.....	1 $\frac{1}{4}$	2 $\frac{1}{4}$	3
Length of Stroke, inches.....	5	6	8
Sizes of Valves, inches.....	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price.....	11.00	14.00	20.00

NASON'S PATENTED STEAM BOILER AND BASE,
IN COMBINATION WITH WORTHINGTON
STEAM PUMP.



Having effected an arrangement with Henry R. Worthington, for the sale of his Pumps in combination with our patented Boiler and Base, we offer for sale the device shown above.

Particular attention is called to the following features of the arrangement, which will be readily recognized as of very considerable advantage in Boilers and Pumps of this class :

The Boiler Base and Bracket, upon which the pump rests, are combined in one, in such a manner as to secure the greatest possible solidity and stiffness with small weight. This result has been obtained by the adoption of the curved form of the supports under the Pump, giving it great strength and an elegant and substantial appearance.

The form of Grate used (not shown in the illustration) is of the Shaking Pattern, and is so constructed that the entire contents may be emptied at a moment's notice, without the usual laborious process of shoveling out through the fire-door.

The Ash-pit door is so constructed that the drafts may be effectually controlled by a Sliding Plate.

The Exhaust Pipe is arranged with a two-way Cock, so that the exhaust may be discharged either into the open air, or into the chimney, when necessary to increase the draft.

PATTERNS FOR GENERAL SERVICE.

Dimensions of Boilers.				Dimensions of Pumps.				Prices.			
Ins.	Ins.	No. and Size of Tubes.	Height of Shell.	Diameter of Shell.	Height of Boiler and Base.	No. of Horse Power.	Length of Tubes.	Diameter of Cylinder.	Gallons Delivered per Minute.	Exhaust Pipe.	Suction Pipe.
24	60	29-2	42	4 1/2	1,150	1,150	4	15 to 30	1 1/2	285	180.00
30	75	42-2	54	8 1/2	1,850	6	6	50 to 80	1 1/2	855	265.00
36	81	55-2	60	12	2,500	7 1/2	10	100 to 140	2 1/2	1,620	385.00
42	87	73-2	63	16	3,425	9	5 1/4	140 to 185	1 1/2	1,950	450.00

PATTERNS FOR LOW SERVICE OR TANK PUMPS.

2 1/2	60	29-2	42	4 1/2	1,150	4	4	35 to 65	1/2	285	180.00
3 1/2	75	42-2	54	8 1/2	1,850	6	5 3/4	110 to 180	1	650	265.00
4 1/2	81	55-2	60	12	2,500	7 1/2	7	10	250 to 335	2 1/2	385.00
5	87	73-2	63	16	3,425	9	8 1/2	10	370 to 490	4	500.00
									2 1/2	5	1,130.00
									2,425	5	450.00
										6	630.00
										5	1,370.00

Water Valves of Rubber or Metal, as may be required. Pumps fitted with Brass Plungers and Piston Rods, price extra.

NASON'S PATENTED STEAM BOILER AND BASE, IN COMBINATION WITH WORTHINGTON STEAM PUMP.—Continued.

Each Boiler is furnished with our New Pattern Water Column, which insures greater certainty in determining the height of the water at all times, thus lessening the danger attending too low a water line.

Each Pump is supplied with an auxiliary side feed, for feeding the Boiler, unless specific directions are given to the contrary; in such cases an injector, or separate pump, may be used for this service.

We are prepared to furnish the list of sizes found in page 137, promptly, and have no hesitation in commanding them as superior to any now offered in this or any other market with which we are familiar.

The quantities delivered per minute, as named in the foregoing tables, are based on that speed of plungers which insures ease of performance under all usual conditions, but in an emergency the speed and quantities to be delivered can be considerably increased.

It should be remembered, in comparing these sizes with single cylinder pumps, that the Worthington Pump has *two* double acting plungers working together, and is, therefore, double the capacity of a single cylinder pump with a plunger of the same diameter.

In the following tables are shown the dimensions of single cylinder pumps of equal capacity with the Worthington Pumps given in the foregoing.

DIMENSIONS OF WORTHINGTON PUMPS.

$4\frac{1}{2} \times 2\frac{3}{4} \times 4$

$6 \times 4 \times 6$

$7\frac{1}{2} \times 4\frac{1}{2} \times 10$

$9 \times 5\frac{1}{4} \times 10$

Dimension required for Single Cylinder Pumps, to do the same work.

$6\frac{3}{8} \times 4 \times 7$

$8\frac{1}{2} \times 5\frac{3}{8} \times 10$

$10\frac{1}{2} \times 6\frac{3}{8} \times 16$

$12\frac{3}{4} \times 7\frac{1}{2} \times 16$

LOW SERVICE OR TANK PUMPS.

$4\frac{1}{2} \times 3\frac{3}{4} \times 4$

$6 \times 5\frac{3}{4} \times 6$

$7\frac{1}{2} \times 7 \times 10$

$9 \times 8\frac{1}{2} \times 10$

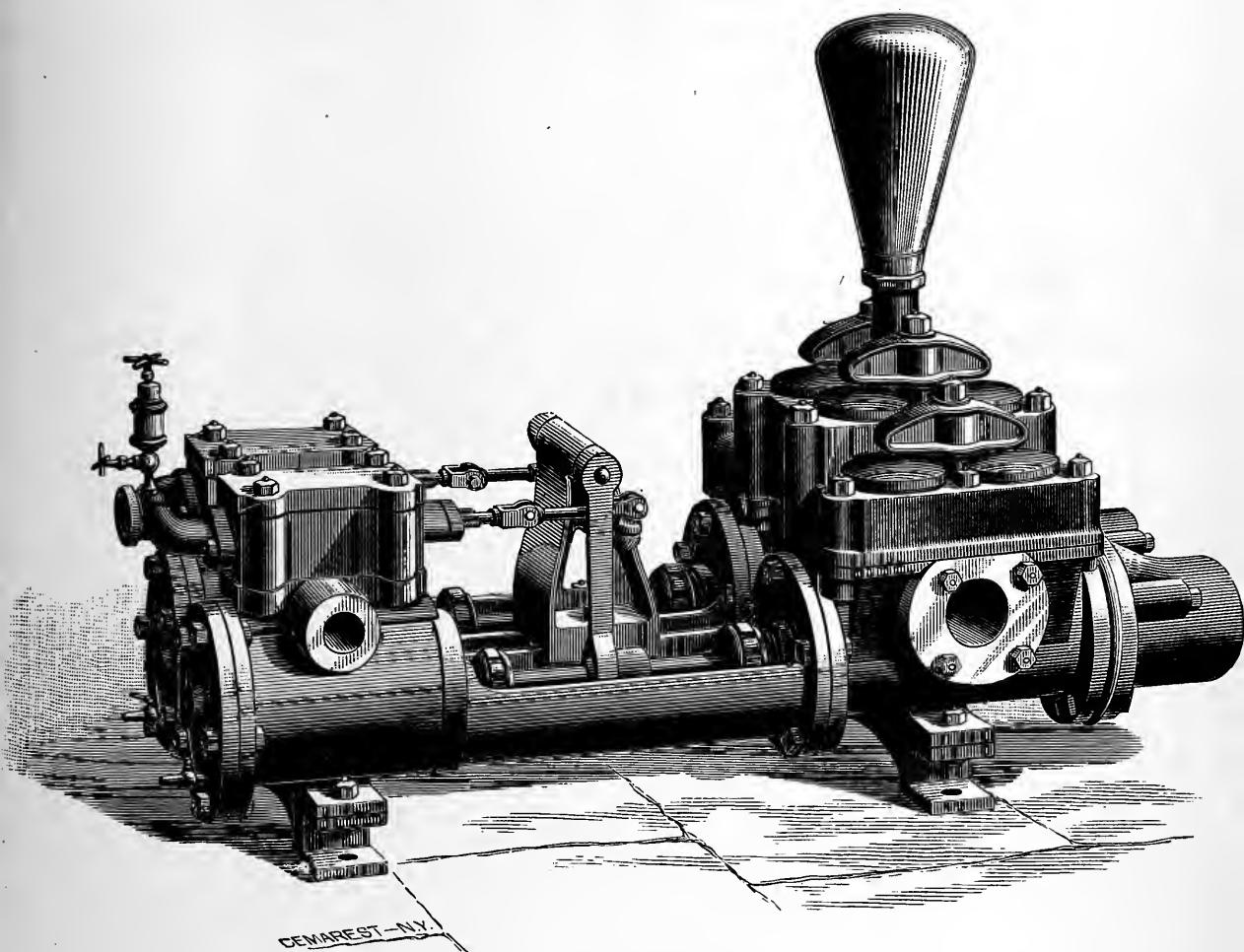
$6\frac{3}{8} \times 5\frac{3}{8} \times 7$

$8\frac{1}{2} \times 8\frac{1}{2} \times 10$

$10\frac{1}{2} \times 9\frac{7}{8} \times 16$

$12\frac{3}{4} \times 12 \times 16$

THE WORTHINGTON STEAM PUMP.



We show above a cut of the Worthington Pump, the simplicity and efficiency of which are well known and recognized. The valve motion is the prominent and important peculiarity of this pump, as being that to which it owes its complete exemption from noise or concussive action. Two steam pumps are placed side by side, and so combined as to act reciprocally upon the steam valves of each other. The one piston acts to give steam to the other, after which it finishes its own stroke, and waits for its valve to be acted upon before it can renew its motion. This pause allows all the water valves to seat quietly, and removes everything like harshness of motion.

As one or the other of the steam valves must be always open, there can be no dead point. The pump is, therefore, always ready to start when steam is admitted, and is managed by the simple opening and shutting of the throttle valve.

The steam valves used are the ordinary slide valve working upon a flat face over ports or openings. Their simplicity and durability, in contrast with any other form of steam valves, are well known. Although numerous attempts have been made to supersede it, it still maintains its place on locomotives and other forms of high-pressure crank engines. No matter how long the engine may stand inactive, a slide valve will not rust or adhere to its seat, and is always ready to start when required. No water can collect in its cavities to produce trouble by freezing. In a word, it may be called the simplest and most reliable steam valve known to engineers.

THE WORTHINGTON STEAM PUMP.—Continued.

In the arrangement of the Worthington Steam Pump special care has been taken to have all the parts easily accessible for inspection or repairs. All the moving pieces being made to gauge, can be readily renewed. The successful application of a pump depends much upon its proper selection from among many patterns differing from each other in size, proportion, material, and general arrangement. When ordering a pump, therefore, the following questions should be answered :

1st.— To what service is it to be applied ?

*2nd.— The quality of the liquid to be pumped — whether salt, fresh, acid, clear or gritty ; and whether it is to pumped cold or hot.

3d.— To what *height* is the water to be lifted *by suction*, and what are the length and diameter of the suction and discharge pipes ?

4th.— Of what material is the suction pipe, and what is its general arrangement as regards other pipes leading into it, etc.?

5th.— To what height, or against what pressure is the water to be pumped ?

6th.— What is the greatest quantity of water needed per hour ?

7th.— What pressure of steam is used ?

In addition to the sizes as listed on the next page, many others are made for special work, catalogues of which will be sent and prices given on application. Among these may be mentioned the following :

LOW SERVICE PUMPS, FOR LIGHT LIFTS AND RAILROAD USE.

COMPOUND PUMPS, WHERE GREAT ECONOMY OF STEAM IS REQUIRED.

PRESSURE PUMPS, WITH OUTSIDE PACKING AROUND PLUNGERS.

FIRE PUMPS, WITH EXTRA LARGE VALVE AREAS

BREWERY PUMPS, FOR AIR OR WATER.

WRECKING PUMPS, FOR RAISING A LARGE QUANTITY OF WATER ON LOW LIFTS.

POWER PUMPS, TO BE DRIVEN WITH A CRANK.

COMPOUND CONDENSING PUMPS, FOR WATERWORKS.

* When hot water is to be pumped, the difficulty of lifting it by suction increases with the temperature. It should therefore be arranged to flow into the pump chamber, if so hot as to vaporize when the pressure of the atmosphere is removed.

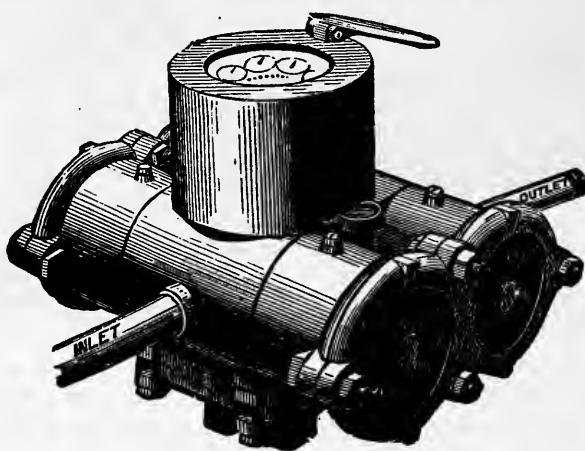
The following Price Lists comprise the sizes for ordinary work. Many others have been made, and patterns of various proportions, and suited to all conditions of service, are kept ready for special orders.

Diameter of Steam Cylinders in inches.	Diameter of Water Plungers in inches.	Length of Stroke in inches.	Displace- ment in U.S. Gallons per single stroke of <i>one</i> plunger.	SIZES OF PIPES FOR SHORT LENGTHS. To be increased as length increases.				PRICE.	Diameter of Plunger required in any single cylinder pump, to do the same work at same speed.
				Steam Pipe.	Exhaust Pipe.	Suction Pipe.	Discharge Pipe.		
4 $\frac{1}{2}$	2 $\frac{3}{4}$	4	.1	75 to 150	30	$\frac{1}{2}$	$\frac{3}{4}$	125.00	4 $\frac{5}{8}$ "
6	4	6	.33	75 to 125	80	1	1 $\frac{1}{2}$	20.00	5 $\frac{3}{8}$ "
7 $\frac{1}{2}$	4 $\frac{1}{2}$	10	.69	75 to 100	140	1 $\frac{1}{2}$	2		6 $\frac{3}{8}$ "
9	5 $\frac{1}{4}$	10	.93	75 to 100	185	1 $\frac{1}{2}$	2		7 $\frac{1}{2}$ "
10	6	10	1.22	50 to 100	245	2	4		8 $\frac{1}{2}$ "
12	7	10	1.66	50 to 100	335	2	2 $\frac{1}{2}$		9 $\frac{7}{8}$ "
14	7	10	1.66	50 to 100	335	2 $\frac{1}{2}$	3		9 $\frac{7}{8}$ "
12	8 $\frac{1}{2}$	10	2.45	50 to 100	490	2	2 $\frac{1}{2}$		12 "
14	8 $\frac{1}{2}$	10	2.45	50 to 100	490	2 $\frac{1}{2}$	3		12 "
16	8 $\frac{1}{2}$	10	2.45	50 to 100	490	2 $\frac{1}{2}$	3		12 "
18 $\frac{1}{2}$	8 $\frac{1}{2}$	10	2.45	50 to 100	490	2 $\frac{1}{2}$	3		12 "
12	10 $\frac{1}{4}$	10	3.57	50 to 100	715	2	2 $\frac{1}{2}$		14 $\frac{1}{4}$ "
14	10 $\frac{1}{4}$	10	3.57	50 to 100	715	2 $\frac{1}{2}$	3		14 $\frac{1}{4}$ "
16	10 $\frac{1}{4}$	10	3.57	50 to 100	715	2 $\frac{1}{2}$	3		14 $\frac{1}{4}$ "
18 $\frac{1}{2}$	10 $\frac{1}{4}$	10	3.57	50 to 100	715	3	3 $\frac{1}{2}$		14 $\frac{1}{4}$ "
14	12	10	4.89	50 to 100	980	2 $\frac{1}{2}$	3		17 "
16	12	10	4.89	50 to 100	980	2 $\frac{1}{2}$	3		17 "
18 $\frac{1}{2}$	12	10	4.89	50 to 100	980	3	3 $\frac{1}{2}$		17 "
18 $\frac{1}{2}$	14	10	6.66	50 to 100	1330	3	3 $\frac{1}{2}$		19 $\frac{3}{4}$ "
17	10	15	5.1	50 to 90	920	3	3 $\frac{1}{2}$		14 "
20	12	15	7.34	50 to 90	1320	4	6	12	17 "
20	15	15	11.47	50 to 90	2065	4	6	12	

Prices furnished on application.

In case of fire or other emergency, the speed of the pumps may be considerably increased beyond the figures stated in the list.

THE WORTHINGTON WATER METER.



This machine is so well known throughout the country that a detailed description of it is deemed unnecessary. It is used in all the principal water-works companies in the United States and Canada, and is recognized as the Standard. It is guaranteed to be accurate and satisfactory in its performance, when properly applied. Besides its extended application to the measurement of water consumed in buildings, it is also used for measuring oil, naphtha, benzine, and chemical fluids, and also to determine the evaporative power of boilers. Full instructions in regard to setting and connecting the meters will be furnished on application.

SIZES AND CAPACITIES OF METERS.

Size of Opening.	Greatest proper Quantity per Minute.	Price.	Permanent Box and Shipping.
$\frac{5}{8}$ inch Pipe.	1 Cubic Foot, or $7\frac{1}{2}$ Gallons.	17.00	1.00
$\frac{3}{4}$ "	2 " or 15 "	27.00	1.50
1 "	4 " or 30 "	37.00	1.75
$1\frac{1}{2}$ "	6 " or 45 "	44.00	2.00
2 "	8 " or 60 "	55.00	2.25
3 "	18 " or 130 "	109.00	3.50
4 "	60 " or 450 "	307.00	4.50

IMPROVED PATTERN, APPROVED AND ADOPTED FOR SERVICE IN NEW YORK CITY.

Size of Opening.	Greatest Proper Quantity per Minute.	Price, delivered at the City Pipe Yard.	Couplings for Connecting the Meters.
$\frac{5}{8}$ inch Pipe.	1 cubic Foot, or $7\frac{1}{2}$ Gallons.	16.00	0.60
$\frac{3}{4}$ "	2 " 15 "	28.00	.90
1 "	4 " 30 "	37.00	1.90
$1\frac{1}{2}$ "	6 " 45 "	57.00	2.50
2 "	8 " 60 "	71.00	3.75
3 "	18 " 130 "	141.00	Screw Flanges.
4 "	60 " 450 "	407.00	3.50
6 "	120 " 900 "		4.50

NASON'S "AUTOMATIC" WATER FEEDER.



FOR CONTROLLING THE WATER LEVEL OF LOW PRESSURE BOILERS FOR DWELLING HOUSES, STORES, CHURCHES, PUBLIC BUILDINGS, ETC.

It is often important to control the fluctuations of the water level of low pressure boilers when used for heating purposes, by means of an Automatic Water Feeder, but these have frequently in the past been open to the grave objection of occasionally becoming inoperative when least expected, the result being that the boiler to which a defective feeder was attached was liable to be either flooded with water or left quite empty, and quickly burned out by the fire coming in contact with the empty boiler.

To obviate the defects in Automatic Feeders causing such accidents to boilers as are above described, we have recently designed one, a cut of which is shown above, and which we introduce with the assurance that the chances of its failure to work are reduced to a minimum.

Among the several advantages, the following may be mentioned :

The position of the valve is such that sediment cannot accumulate around or under it.

A pocket between the inlet pipe and valve, for collecting sediment, is introduced, so that little or no dirt can enter the Feeder. This accumulation should be drawn off about once a month.

For controlling the valve a float of large size is used, and its movement is greater than with the old form of feeder.

By simply unscrewing a brass cap the valve can be immediately reached for cleaning or examination without disconnecting the Feeder.

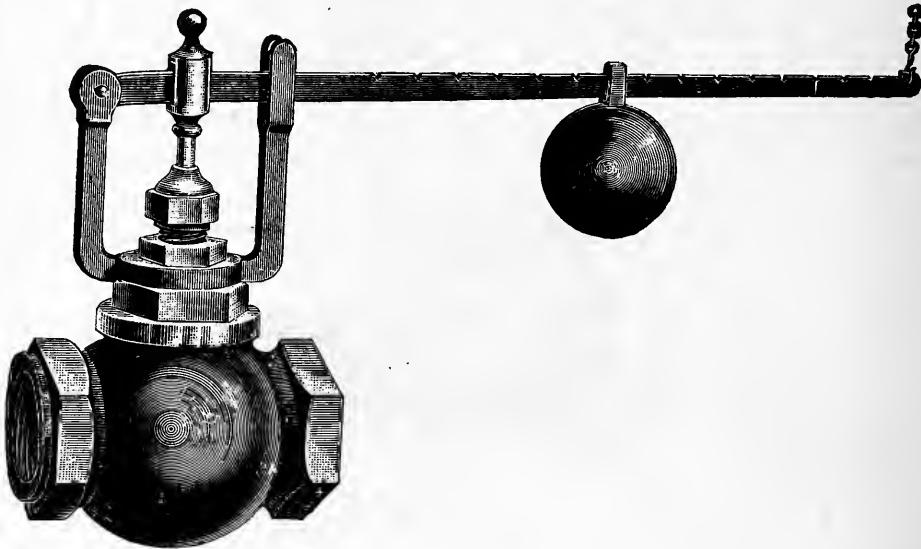
Outlets for the gauge-glass are left on both sides of the case, so that the Feeder can be connected either right or left hand.

The form of the float lever is such that it is quite short, and the length of the entire Feeder is much reduced—an important feature where space is limited.

For the benefit of purchasers, the following dimensions are given, which may be of assistance in connecting the Feeder :

Outside length.....	24 $\frac{1}{2}$ in.
Height	13 in.
Width.....	9 in.
Size of Boiler Connection.....	1 in.
Size of Gauge Glass Connection.....	$\frac{1}{2}$ in.
Size of Feed Water Inlet.....	$\frac{3}{4}$ in.
Price.....	20.00
Price with Water Gauge, including Glass.....	22.00

NASON'S IMPROVED QUICK-OPENING ELEVATOR
REGULATING VALVE,
WITH BALANCED DISCS.



They are offered to the trade as the most reliable valve made for the automatic and positive control of the speed of all pumps and engines which are used for tank service in connection with elevators, or for pumping water into reservoirs for general use.

Being connected in the line of steam supply to the pump to be regulated, they are operated by a float placed either in the upper or lower tank of the elevator, and as a movement in the valve of from $\frac{1}{2}$ in. to 2 in. (depending upon its size) is sufficient to entirely open or close it, their extreme sensitiveness is apparent.

This valve is made as shown in the above cut, either with yoke, lever, and weight, or without these additions, the spindle being in the latter case left plain on the upper end, as with our regular Balanced Disc Governor Valve.

A prominent feature is the form of Valve Chamber adopted, and the means taken to avoid restriction of the easy flow of steam through its passages, by the shape of the valve openings, and the large areas used.

All possible care is taken in their manufacture, the moving part being so nicely balanced that but little force is necessary to open or close the valve, irrespective of the pressure of the steam passing through it.

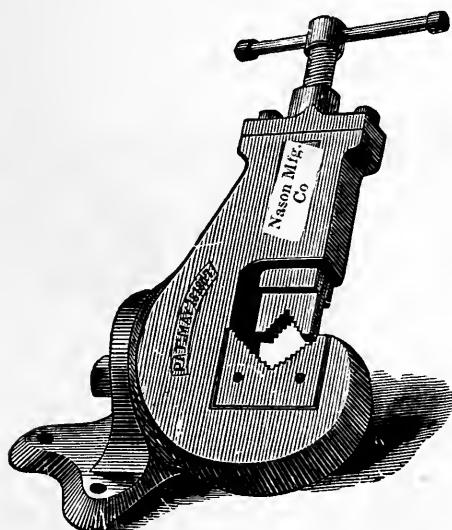
In their process of manufacture, before being completely finished, they are tested to the temperature of the steam which is to be used in them, and the valve discs are ground in, while hot, in order to test their being as nearly steam-tight as possible under pressure.

The following is a list of the regular sizes kept in stock, with prices annexed. Larger or special sizes will be promptly made to order on request.

All the bodies of the valves are made of heavy composition metal, with the exception of the two largest sizes (3 in. and 4 in.) — the latter being of iron, with brass trimmings.

Sizes	1 in.	1 $\frac{1}{4}$ in.	1 $\frac{1}{2}$ in.	2 in.	2 $\frac{1}{2}$ in.	3 in.	4 in.
Price, Brass.....	5.00	6.50	8.50	13.00	21.00	....	....
Price, Iron Body .....	....	....	....	....	....	32.00	50.00

NASON'S PATENT PIPE VISE.



In the Pipe Vises hitherto in use, the jaws are so inclosed on all sides that the pipe can only be entered *endwise*, making it necessary to reserve a space beyond the Vise equal to the length of the longest pipe to be screwed. In the IMPROVED VISE one side is open, admitting the pipe *sidewise*, and saving about half the room that would be otherwise required.

This side opening is attended with the further advantage that the Vise may be used for holding pipes, while elbows, tees, or other fittings are screwed upon one or both ends, or for taking apart old pipe-work in which the parts have become rusted together. This is not possible in Vises with inclosed jaws, as pipes with fittings upon their ends cannot be inserted or released.

The movable or working parts of the IMPROVED VISE are so arranged as to present the greatest strength and resistance to wear, and the greatest facility for repair or renewal. They are also carefully fitted by planing and turning.

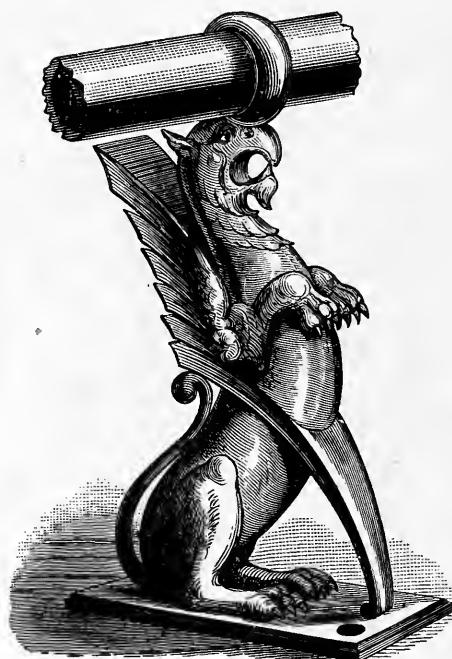
SIZES AND PRICES.

No. 1, to hold pipe from $\frac{1}{8}$ to $1\frac{1}{4}$ inch diameter.....	15.00
" 2, " " $\frac{1}{8}$ to 2 "	18.00
" 3, " " $\frac{1}{4}$ to 3 "	30.00

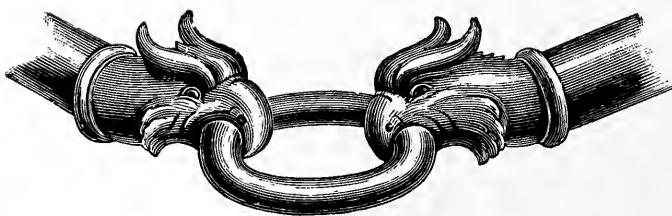
NASON'S "GRIFFIN" FOOT RAIL BRACKET,

WITH CORNER AND END PIECES.

PATENTED 1882.



Foot-rail Bracket.—Large scale, showing design.



Corner Fitting.—Showing detail of design.



End Piece.

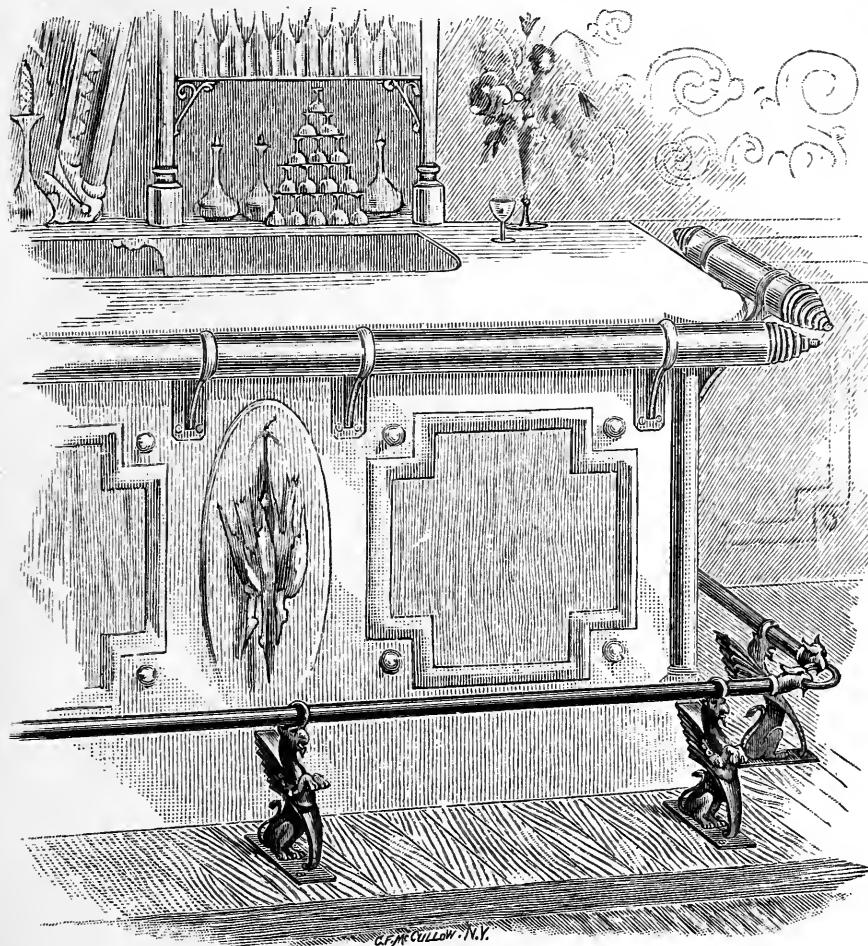


Acorn End Piece.



Rosette, for Railing.

NASON'S "GRIFFIN" FOOT RAIL BRACKETS.—Continued.



Shown as put up, ready for use.

It has been our aim in designing the "Griffin foot-rail bracket," as illustrated herewith, to produce an article artistic in design, and fitted in form so as to bear the heaviest strain with the least possible chance of disarrangement, while at the same time it is a model of lightness.

Their design is artistic, and their lightness and beauty of form is such that they add to, and improve the appearance of the most handsome surroundings, while in point of cleanliness they far surpass the gaping "Y" support, now so commonly used, as they present no interstices where dirt of any kind can gather.

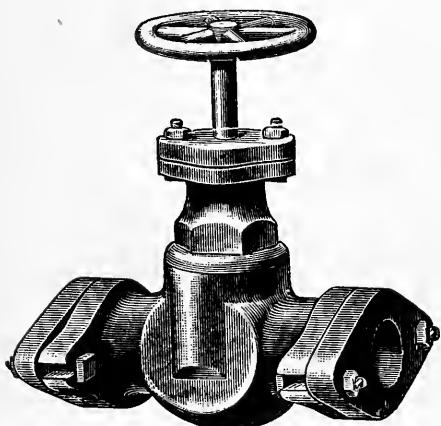
It may be mentioned that where rails with the old form of bracket are in place and in use, the latter can be removed and substituted with the "Griffin" pattern without discarding the rail, and considerable expense be thus saved, while the handsome effect of a new rail will be given.

We manufacture them in plain or galvanized iron, bronze, and brass, and will furnish them at the following figures, net :

	Plain Iron.	Bronzed Iron.	Galvanized Iron.	Artistic Brass.
Brackets, - - - -	.50	.85	.85	3.50
Corner Fittings, - - - -	.50	.75	.75	3.00
End Finish Fittings, - - - -	.15	.25	.25	1.40
Acorn End Piece, - - - -	.10	.18	.18	.65
Rosette for Railing, - - - -	.08	.15	.15	.50

Or we will furnish estimate for fitting them up with the necessary rail, complete, in the very best manner.

NASON'S FITTINGS FOR ANHYDROUS AND AQUA AMMONIA.



LARGE SIZE VALVE.

We are now manufacturing, and offer for sale, a new class of valves, especially designed for and adapted to ammonia machinery, as used for ice-making and refrigerating purposes.

Necessarily constructed as they are entirely of iron, we have used particular care in the selection of the material, and are now using a composition which is both tenacious and, at the same time, close in grain and texture, preventing the escape of gas through the pores of the metal.

Such parts as are subjected to unusual strain are made of wrought iron, and the metal in the

remainder is moulded in such a manner as to reduce to a minimum the danger of sand holes and flaws.

The valves are heavy, the metal ranging from $\frac{1}{2}$ inch to $\frac{3}{4}$ inch in thickness, to secure greater solidity and closeness of texture. Particular care has been paid to the stuffing boxes, which are made, as shown in the cuts, of large size.

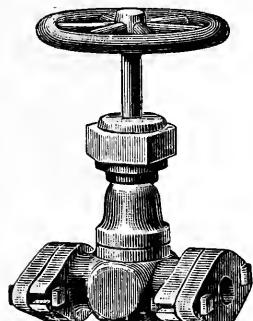
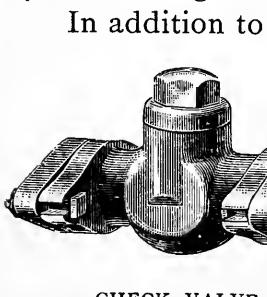
Each is provided with a chamber for holding glycerine, which is poured through an opening made for this purpose. By this means the packing is kept moist and impervious to the gas, so that it is unnecessary to screw the packing down hard; and while there is little or no leakage around the spindles, the latter can be turned with ease.

In general form of construction the check valves are similar to the regular ammonia valves, the same pipe joints being used.

By unscrewing the cap on top, the disc and spindle can be readily removed.

In addition to the valves we are also making for the same class of machinery

a form of gauge glass which is particularly safe and desirable. They are also constructed entirely of iron, and are of the same general form as the valves, the stuffing boxes being also of liberal size. The most important feature of the gauge is a self-operating valve, so constructed that on the accidental breaking of a glass they will instantly close and prevent the

SMALL AMMONIA
VALVE.

CHECK VALVE.



AUTOMATIC AMMONIA GAUGE.

escape of any liquid. The value of this improvement will be particularly appreciated where a gauge is attached to a cylinder containing liquefied ammoniacal gas, the escape of a large volume of which is likely to lead to disastrous results.

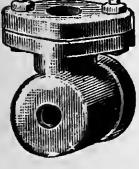
Both valves and gauges are adapted to machines working on either the compression or absorption system. They are tested and proved under 300 lbs. pressure at our factory before being delivered, and are guaranteed tight.

A large assortment of fittings is offered, and a list of the regular sizes will be found below. An extended experience with the form of joint used proving its perfect simplicity and freedom from leakage.

After the joint is made, a rubber washer is screwed down into a gland, and effectually prevents all escape of gas.

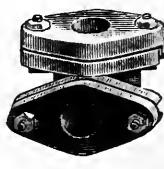
As shown in the accompanying cuts, we make a general line of tees and crosses in addition to the elbows. There are often occasions when it is desirable to use special or other reducing fittings. A sample of one of these is here shown on the margin.

For running gas in cellars direct, we make and offer several sizes of return bends with Nason's Ammonia Joint. They will be found the most simple, tight, and effective pattern for this purpose in the market.

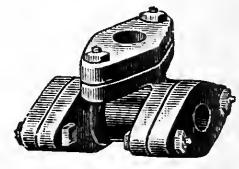
 SPECIAL REDUCING TEE. Our coupling is shown herewith. The same form of joint is used as with the other fitting, but the ends being tapped right and left, any section of pipe can be removed in a line without taking down or disturbing the remainder.

The cut below shows our header or manifold for connecting coils, when it is desired to condense the surface into as compact a volume as possible. They are particularly adapted to coils for condensing purposes, and many of them are now in use for this purpose.

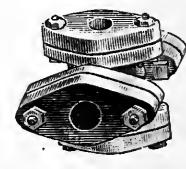
 RETURN BEND. For absorption machines we are selling many of the strainers, also shown on the next page, which were designed to meet the necessity for a device



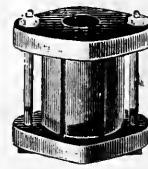
ELBOW.



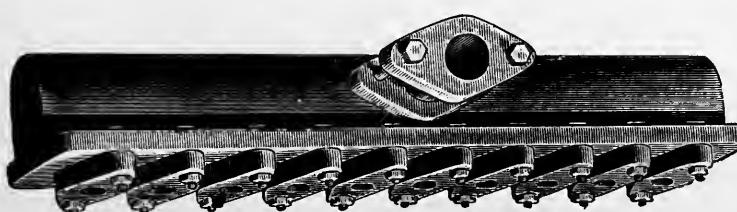
TEE.



CROSS.

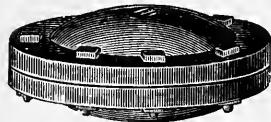


COUPLING.



HEADER.

to keep dirt out of the aqua ammonia pump and its valves. They are designed to be placed on the suction pipe, close to the pump, and no absorption machine is complete without one.



AQUA AMMONIA
STRAINER.

Where brine circulation is preferred, or to be used, we can supply a large assortment of return bends, both of open or close pattern, and tapped right and left, or on, any angle, if desired. The cut here shown is for 1 inch pipe, and is 4 inch to centers.



RETURN BEND 4
INCH CENTERS.

Below are prices at which we are offering the goods. A considerable stock is carried, and orders, either by mail or telegraph, will receive prompt attention.

GLOBE AND CHECK VALVES.

Size.....	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Globe Valves.....	4.00	5.00	7.00	8.50	10.00	12.00	14.00	16.00
Check Valves.....	2.75	3.50	5.00	6.00	7.50	8.00	9.50	11.00

AMMONIA GAUGES.

Complete, including glass.....								12.00
--------------------------------	--	--	--	--	--	--	--	-------

ELBOWS—

Sizes.....					$\frac{1}{2}$	$\frac{3}{4}$	1	
Price.....					1.40	1.60	1.90	

TEES—

Sizes.....					$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price.....					1.80	2.00	2.40	3.00

TEES—REDUCING—

Sizes.....					1 x $\frac{1}{2}$		2 x $\frac{1}{2}$ x $\frac{1}{2}$	
Price.....							1.60	1.25

CROSSES—

Sizes.....					$\frac{3}{4}$ x $\frac{1}{2}$		1 x $\frac{1}{2}$	
Price.....							3.20	3.80

RETURN BENDS—

Sizes.....					$\frac{3}{4}$	1	$1\frac{1}{2}$	
Price					1.80	2.10	6.00	
Return Bends—Open Pattern—4 inch centers, price each.....								30 cents.

COUPLINGS—

Sizes.....	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price	70c.	1.00	1.30	1.70	2.00	3.00	4.00	....

HEADERS—10 pipes, price.....

16.00

HEADERS—5 pipes, price.....

10.00

Ammonia Strainers, price.....

10.00

USEFUL INFORMATION,

COMPILED FROM SEVERAL

AUTHENTIC SOURCES,

FOR THE USE OF STEAM FITTERS, ETC.

ALSO, A NUMBER OF

CONVENIENT TABLES.

ETC., ETC.

USEFUL INFORMATION

FROM

“Steam Heating for Buildings,”

(WITH THE KIND CONSENT OF W. J. BALDWIN, M.E.)

TO APPROXIMATE THE AMOUNT OF HEATING SURFACE DESIRED FOR BUILDINGS.

The familiar method of arriving at the desired surface for warming buildings is to multiply the length by the breadth and the result by the height, then cut off two figures from the right hand side and call the remainder square feet of heating surface.

For buildings in exposed or corner positions, an addition of from 15 per cent. (for inner rooms) to 50 per cent. (for very exposed rooms) should be made. This addition is also intended to provide for window surface and leakage in windows.

In deciding any necessary addition of surface, much depends on the construction of the building; for while a given quantity might be ample for a well constructed building, it might be very deficient in a poorly constructed one.

TABLE of Power of Transmitting Heat of various Building Substances,
compared with each other.

Window glass.....	1,000
Oak and walnut.....	66
White pine.....	80
Pitch pine.....	100
Lath and plaster.....	75 to 100
Common brick (rough).....	200 to 250
Common brick (whitewashed).....	200
Granite or slate	250
Sheet iron	1,030 to 1,110

The area of the cross section of a one inch steam pipe (.7854) is taken as unity for the sake of easy calculation in the rating of steam pipes, and the area of a one inch pipe in the main, at the boiler to each one hundred square feet of heating surface, mains included, is deduced from the size of the mains and heating surface of some of the best heated buildings in the United States.

The areas of circular pipes are to each other as the squares of their diameters.

To ascertain the area of any size of pipe, multiply the area of one inch pipe, viz: .7854 by the square of its diameter. Thus: the area of a four inch pipe is equal to 4×4 , or $16 \times .7854 = 12.59$.

TABLE showing the Relative Areas of Standard, Wrought-iron Gas, Water and Steam Pipe, from $\frac{1}{8}$ to 9 inches, inclusive.

USEFUL INFORMATION.—Continued.

TABLE showing the Relative Areas of Standard, Wrought-Iron, Gas, Water and Steam Pipe, from $\frac{1}{8}$ to 9 inches, inclusive.—Continued.

.....	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	5	6	7	8	9
$\frac{1}{8}$	400	576	784	1,024	1,600	2,304	3,136	4,096	5,184
$\frac{1}{4}$	100	144	196	256	400	576	784	1,024	1,296
$\frac{3}{8}$	44 $\frac{4}{9}$	64	87 $\frac{1}{9}$	113 $\frac{7}{9}$	155 $\frac{5}{9}$	256	348 $\frac{4}{9}$	455 $\frac{1}{9}$	574 $\frac{8}{9}$
$\frac{1}{2}$	25	36	49	64	100	144	196	256	324
$\frac{5}{8}$	11 $\frac{1}{8}$	16	21 $\frac{7}{9}$	28 $\frac{1}{9}$	44 $\frac{4}{9}$	64	87 $\frac{1}{9}$	113 $\frac{7}{9}$	144
1	6 $\frac{1}{4}$	9	12 $\frac{1}{4}$	16	25	36	49	64	81
1 $\frac{1}{4}$	4	5 $\frac{1}{2}$ $\frac{9}{5}$	7 $\frac{2}{5}$ $\frac{1}{5}$	10 $\frac{6}{5}$	16	21 $\frac{11}{25}$	31 $\frac{9}{25}$	40 $\frac{24}{25}$	51 $\frac{11}{25}$
1 $\frac{1}{2}$	2 $\frac{7}{8}$	4	5 $\frac{4}{9}$	7 $\frac{1}{9}$	11 $\frac{1}{8}$	16	21 $\frac{7}{9}$	28 $\frac{4}{9}$	36
2	1 $\frac{1}{8}$	2 $\frac{1}{4}$	3 $\frac{1}{16}$	4	6 $\frac{1}{4}$	9	12 $\frac{1}{4}$	16	20 $\frac{1}{4}$
2 $\frac{1}{2}$	1	1 $\frac{1}{2}$ $\frac{5}{8}$	1 $\frac{2}{5}$ $\frac{4}{5}$	2 $\frac{14}{25}$	4	5 $\frac{1}{2}$ $\frac{9}{5}$	7 $\frac{2}{5}$ $\frac{1}{5}$	10 $\frac{6}{5}$	12 $\frac{2}{5}$ $\frac{4}{5}$
3	.....	1	1 $\frac{1}{16}$	1 $\frac{7}{9}$	2 $\frac{7}{9}$	4	5 $\frac{4}{9}$	7 $\frac{1}{9}$	9
3 $\frac{1}{2}$	.....	.....	1	1 $\frac{5}{9}$	2 $\frac{2}{9}$	2 $\frac{4}{9}$ $\frac{6}{9}$	4	5 $\frac{11}{9}$	5 $\frac{3}{9}$ $\frac{0}{9}$
4	.....	.....	.....	1	1 $\frac{9}{16}$	2 $\frac{1}{4}$	3 $\frac{1}{16}$	4	5 $\frac{1}{6}$
5	.....	.....	.....	.....	1	1 $\frac{11}{25}$	1 $\frac{2}{5}$ $\frac{4}{5}$	2 $\frac{14}{25}$	3 $\frac{2}{5}$
6	.....	.....	.....	.....	.....	1	1 $\frac{13}{36}$	1 $\frac{7}{9}$	2 $\frac{1}{4}$
7	.....	.....	.....	.....	.....	.....	1	1 $\frac{5}{9}$	1 $\frac{3}{8}$ $\frac{2}{9}$
8	.....	.....	.....	.....	.....	.....	.....	1	1 $\frac{7}{6}$ $\frac{7}{4}$

PAINTING PIPES.

Distributing pipes may be painted with anything that will arrest oxidation; lead paints are very good, for they are the poorest conductors of heat; but the lead paints should not be used on radiating surfaces, as they lessen the radiating and transmitting power. Many coats applied, year after year, continually impair their efficiency greatly.

Zinc paint is considered somewhat better, but there is good reason to say that it should not be used.

Raw linseed-oil with ochre of the required color, and turpentine, form a good preparation for radiators when they are to be bronzed, as it gathers and "fixes" any machine oil or dirt there may be on the pipes, and will make a good *back* for the bronze.

Black baking japan, or black air-drying japan are very good substances for painting radiators with, as they appear to impair their efficiency but little, and two coats will give a good gloss, which does not require to be renewed. A wipe with a slightly oiled woolen cloth will give them a fresh appearance.

Black paraffine varnish should not be used; it is not permanent; it chokes with heat and has no body.

Indirect coils, or coils or heaters not in sight, should not be painted. Dust allowed to collect on heaters impairs them very much.

A cubic foot of water at a temperature of 60, weighs 62 $\frac{1}{2}$ lbs. At 212 it weighs a little less than 60 lbs.

A cubic foot of water contains very nearly 7 $\frac{1}{2}$ gallons.

One gallon equals 231 cubic inches.

One cubic foot, or 7 $\frac{1}{2}$ gallons, equals 1,728 inches.

USEFUL INFORMATION.—Continued.

A TABLE of Linear Expansion, of Wrought and Cast-iron Pipes (to within the $\frac{1}{100}$ of an inch), for each 100 feet in length, at Temperatures and Pressures most frequently required by the Steam-fitter.

WROUGHT IRON.

Temperature of the Air when the Pipe is fitted.	Length of Pipe when fitted.	Length of Pipe when Heated to			
		215° or 1 lb. of Steam.	265° or 25 lbs. of Steam.	297° or 50 lbs. of Steam.	338° or 100 lbs. of Steam.
Degrees, Fahr.	Feet.	Feet. Ins.	Feet. Ins.	Feet. Ins.	Feet. Ins.
0	100	100 1.72	100 2.12	100 2.31	100 2.70
32	100	100 1.47	100 1.78	100 2.12	100 2.45
64	100	100 1.21	100 1.61	100 1.86	100 2.19

CAST IRON.

0	100	100 1.59	100 1.96	100 2.20	100 2.50
32	100	100 1.36	100 1.65	100 1.96	100 2.27
64	100	100 1.12	100 1.43	100 1.73	100 2.00

Calculated for Regnault's temperatures, and Lavoissier and Laplace's difference of expansion.

EXHAUST STEAM AND ITS VALUE.

Among the many who own steam engines, and the engineers who run them, there are a few who have a just appreciation of the *thermal* value of the clouds of exhaust steam continually blown to the winds from the apparently numberless exhaust pipes, which can be seen from the top of a high building in any of our large cities.

When I say that three-quarters of the *practical* thermal value of every pound of coal burned in the boiler furnace, is lost past recovery to the consumer, I am putting it at less than the actual loss, and could this heat be converted into available motion, suitable for power purposes, it would be a boon indeed, and a fortune to the one who could do it. Perhaps there is a chance for the electrician to convert it into energy; but as yet engineers can use it for heating purposes only, where its full value can be shown in the heating of water, air, or any tangible substance.

The first purpose for which the exhaust steam is generally employed is to warm the feed water, the object being to raise its temperature as high as possible, before it enters the boiler, thereby to save fuel.

The next general purpose for which the exhaust steam from an engine can be used, is in the warming of the air of a building, to which purpose it is often applied, *though not as much as it should be*, as there appears to be an idea among many users of steam, *that it is just as well to take live steam from the boiler* as to cause one or two pounds back pressure on the engine for the purpose of getting a circulation, and driving the air from all parts of the coils.

The loss in power to an engine from back pressure is very nearly directly as the difference between back pressure and mean pressure. Thus, in an engine of fifty pounds mean pressure, with a back pressure of two pounds, there is a loss of 4 per cent., and as the available energy of an engine cannot represent one-quarter of the *practical thermal* value of the coal, the loss caused by two pounds back pressure cannot represent more than 1 per cent. of the coal, and as it is an incontrovertible fact that the exhaust steam contains more than three-fourths, or 75 per cent. of the *practical*

thermal value of the coal, the balance is largely in favor of *using the exhaust steam*. The steam fitter, when preparing to use the exhaust, usually places a *back pressure valve* in the exhaust pipe, of such construction that it can be loaded to suit, so as to reduce the back pressure to a minimum when in use, and to hold it open when not required.

"Steam Heating for Buildings"—Baldwin.

A popular and perhaps natural prejudice against warming by exhaust steam because of undue back pressure on the engine, has come from the many defective and badly designed apparatus that have been constructed. It may be accepted as a fact that where the apparatus is unsatisfactory, or the back pressure exceed two lbs. per square inch, that the fault is due, not to the use of exhaust steam, but in all cases to the manner in which the pipes used for heating surface and their connecting lines have been run.

Such difficulties can always be avoided by following a few simple general rules, and an economic result gained which will be always gratifying to the large consumer of coal, who may be otherwise throwing away through the exhaust pipe more heat than will comfortably warm his mill or factory. To start with, the exhaust pipe should always be of liberal size (at least what is specified by the manufacturer of the engine), and it should be run to the roof or place of exit without any reduction whatever.

Near the exhaust outlet should be connected a back pressure valve, so constructed that the lever may be weighted in such manner that the steam passage may be freely open during the Summer, and at times when heat may not be called for, or a pressure of any desired amount be maintained back of it upon the pipe and engine.

From this tube, as a main supply, should be taken the several horizontal branches for conveying steam to the coils or radiators in the various rooms or shops to be heated. These outlets should be invariably near the ceiling, or at least several feet above the coils to be supplied on each floor, in order to insure a fair pitch and downward run for any water of condensation that accumulates.

This will avoid the possibility in any case of accumulated water running in the opposite direction to or against the steam supply, thus obviating any tendency to obstruct or close the inlet, and thus cause back pressure.

Such supply pipes will naturally pitch toward the coils below them, but care should be observed to keep the areas in all cases of liberal size, and they should be as short as practicable. It is safe and indeed necessary to make the areas of the supply pipe at least 50 per cent. more than that of the exhaust pipe from the engine, although the outlay on the start may be somewhat more than for smaller pipes, the gain in results by freedom from back pressure on the engine and from a prompt steam supply at every portion of the apparatus will speedily pay for the small additional cost.

A considerable experience in this department has shown that it is neither safe nor desirable to make the lineal distance that steam has to pass through a heating coil of one inch pipe more than 100 feet. A greater length than this is likely to cause more back pressure than should exist, and by using a sufficient number of supply pipes there need be no difficulty in keeping the length within these dimensions.

Good practice advises the use of an air outlet at the end of each steam coil, which should be controlled with a valve, and the vent may be properly taken to the roof or elsewhere through a small discharge pipe. Water of condensation at the end of each coil should be delivered through a trap or inverted "U" siphon of pipe into a pipe or condenser, which should be open to the atmosphere, in order to avoid any back pressure whatever. Such traps are advised to prevent the discharge of steam through into the return and into the engine-room, where it would be obnoxious.

Through the return the water will pass into a general hot well in the engine-room, where any dirt or grease used in lubricating the engine is removed either by settling or by drawing off from the surface.

From the hot well the water is re-pumped through a feed water heater of approved construction into the boilers, to be again evaporated, and continue the circuit.

It will be seen from the above that if exhaust steam can be practically used, real advantages follow, the most important of which are these:

1st. A saving of fuel during the winter months equal to one-half of what would otherwise be necessary during that time.

2d. The preservation of all, or nearly all, of the water used in the boiler during winter months for feeding it, and the return to the boiler under a high temperature.

Finally, it should be remembered that any factory, unless of extraordinary dimensions can be heated by exhaust steam with a back pressure not to exceed one to one and a half lbs. per square inch, and a contractor, in completing an apparatus, should be required by a mill-owner to guarantee its circulation within these figures.

Nason Manufacturing Company.

VENTILATION.

Each person requires at least from 3 to 4 cube feet of air per minute. Ordinary windows allow about 8 cube feet per minute to pass.

WARMING BY STEAM.

When the external temperature is 10° below freezing point, in order to maintain a temperature of 60° ,

One superficial foot of steam pipe for each 6 superficial feet of glass in the windows.

One superficial foot of ditto for every 6 cube feet of air escaping for ventilation per minute.

One superficial foot of ditto for every 120 feet of wall, roof or ceiling.

One cube foot of boiler is required for every 2,000 cube feet of space to be heated.

One horse-power boiler is sufficient for ~~50,000~~ cube feet of space. Steam should be about ~~112~~ ⁹⁵⁰⁰ 318

WARMING BY HOT WATER.

P = Temperature of pipes.

T = Temperature required in building.

t = Temperature of external air.

C = Cube feet of air to be warmed per minute.

L = Length of pipe in feet.

$$L = \frac{(P - t) (T - t)}{P - T} \times .0045 \text{ C. for 4-in. pipes.}$$

$$L = \frac{(P - t) (T - t)}{P - T} \times .006 \text{ C. for 3-in. pipes.}$$

$$L = \frac{(P - t) (T - t)}{P - T} \times .009 \text{ C. for 2-in. pipes.}$$

Molesworth—page 374.

A diameter is very nearly .32 of its circumference. A circumference is 3.14 of its diameter.

One perch of stone work, in walls or foundations, measures $24\frac{3}{4}$ cubic feet.

One thousand common bricks, laid in a wall, makes about 50 cubic feet, varying a little for different bricks.

USEFUL INFORMATION.—Continued.

Six fire bricks to each square foot of lining, one brick thick, is sufficient; 1,000 bricks will make 170 superficial feet of lining, laid in the ordinary way.

To find the weight of iron castings by computation:—Find its solid contents, in inches, and multiply them by .26, and it will give the weight in pounds. For rough calculations it will do to divide the cubic inches by 4, and call the result pounds.

To find the weight of any other casting, or forging:—Find its solid contents in cubic inches, and multiply by the weight of a cubic inch of the metal, as given in the table, "Weight of a cubic inch of various metals."

For irregular castings, which are difficult to measure, and cannot be conveniently weighed, a rough estimate of their weight may be taken, provided they are not cored out, by weighing the pattern, if it is of soft pine, and allowing thirteen times the weight of the pattern, if it is new, or just out of the sand, and fourteen times if it has laid in the pattern loft for some time.

A square foot of cast-iron, one inch thick, weighs $37\frac{1}{2}$ lbs. To find what a square foot of any other thickness will weigh, multiply $37\frac{1}{2}$ by the thickness in inches, or fractions of an inch.

A square foot of rolled wrought iron, one inch thick, weighs 40 lbs. To find the weight of boiler plates, or sheet iron, per square foot, multiply 40 by the decimal of an inch in thickness the required plates are to be.

To find the weight of a cast-iron pipe, for one foot of its length:—Multiply the diameter of the pipe in inches by 3.1416 , and multiply the answer thus obtained, by the thickness of the pipe in inches, or decimals of an inch, then by 12 and 0.26 respectively; or instead of the last two, use 3.15. This will give about the weight of the pipe, including the hubs, as the outside circumference of the pipe is not the *mean* length of the iron, according to its thickness.

Of the Power of Chimneys to Steam Boilers, having Flues 100 feet long, in Circuit from Furnace to Chimney.—Thomas Box—page 95.

Size at the Top, Inside.	40 Feet.		60 Feet.		80 Feet.		100 Feet.		120 Feet.		150 Feet.	
	Round.	Square.	Round.	Square.	Round.	Square.	Round.	Square.	Round.	Square.	Round.	Square.
Ft. In.	H. P.	H. P.										
1 0	6.4	8.1										
1 3	10.9	13.9	12.8	16.3								
1 6	16.6	21.0	19.5	24.8	21.7	27.5						
1 9	23.6	30.0	27.9	34.2	31.1	40.0						
2 0	31.9	41.0	37.3	47.5	42.3	53.8	45.7	58.2				
2 3	.....	.....	49.4	62.8	55.3	70.4	60.0	76.4	63.8	81.2		
2 6	.....	.....	65.3	83.1	70.4	90.0	76.5	97.4	81	103	85	108
2 9	.....	.....	78	100.0	88	112	94.9	121	101	128	106	135
3 0	.....	.....	94	123	106	135	114	145	123	157	130	165
3 6	.....	.....	.....	150	191	163	207	175	223	186	237	
4 0	.....	.....	.....	202	257	220	280	235	300	252	321	
5 0	.....	.....	.....	.....	360	458	388	494	415	528		
6 0	.....	.....	.....	.....	.....	577	734	615	783			

NOTE.—The power of the chimneys in this table is three-fourths of their absolute maximum power: thus the maximum power of a chimney 3 ft. 6 in. diameter, 80 feet high, is 150×4

$\frac{150 \times 4}{3}$ = 200 horse-power, &c.

3

THERMOMETER.—Molesworth—page 375.

To convert degrees, Centigrade or Reaumur, into degrees Fahrenheit.

Let F = No. of degrees Fahrenheit.

C = No. of degrees Centigrade.

R = No. of degrees Reaumur.

$$F = \frac{9C}{5} + 32. \quad F = \frac{9R}{4} + 32 = C + R + 32.$$

$$C = \frac{5(F - 32)}{9}. \quad R = \frac{4(F - 32)}{9}.$$

Freezing point, or 32° Fah. = Zero in Centigrade, or Reaumur.
Boiling point, or 212° Fah. = 100° Centigrade, or 80° Reaumur.

TABLES OF THE PROPERTIES OF SATURATED STEAM.

Molesworth—pages 451 and 452.

Atmosphere Included.		Temperature of Steam.	Specific Volume.	No. of Atmos- pheres.	Atmosphere Excluded.	
Lbs. per sq. inch.	Inches of Mercury.				Inches of Mercury.	Lbs. per sq. inch.
1	2.0355	102.1	20582	.068	-27.886	-13.7
2	4.0710	126.3	10721	.136	-25.851	-12.7
3	6.1065	141.6	7322	.204	-23.815	-11.7
4	8.142	153.1	5583	.272	-21.780	-10.7
5	10.178	162.3	4527	.340	-19.744	-9.7
6	12.213	170.2	3813	.408	-17.709	-8.7
7	14.249	176.9	3298	.476	-15.673	-7.7
8	16.284	182.9	2909	.544	-13.638	-6.7
9	18.320	188.3	2604	.612	-11.602	-5.7
10	20.355	193.3	2358	.680	-9.567	-4.7
11	22.391	197.8	2157	.748	-7.531	-3.7
12	24.426	202.0	1986	.816	-5.496	-2.7
13	26.462	205.9	1842	.884	-3.460	-1.7
14	28.497	209.6	1720	.952	-1.425	-0.7
14.706	29.922	212.0	1642	1.000	-0.000	-0.0
15	30.533	213.1	1610	1.020	0.611	0.3
16	32.568	216.3	1515	1.088	2.646	1.3
17	34.604	219.6	1431	1.156	4.682	2.3
18	36.639	222.4	1357	1.224	6.717	3.3
19	38.675	225.3	1290	1.292	8.753	4.3
20	40.710	228.0	1229	1.360	10.788	5.3
21	42.746	230.6	1174	1.428	12.824	6.3
22	44.781	233.1	1123	1.496	14.859	7.3
23	46.817	235.5	1075	1.564	16.895	8.3
24	48.852	237.8	1036	1.632	18.930	9.3
25	50.888	240.1	996	1.700	20.966	10.3
30	61.065	250.4	838	2.040	31.143	15.3
35	71.243	259.3	726	2.380	41.321	20.3
40	81.420	267.3	640	2.720	51.498	25.3
45	91.598	274.4	572	3.060	61.676	30.3
50	101.776	281.0	518	3.400	71.854	35.3
55	111.953	287.1	474	3.740	82.031	40.3
60	122.131	292.7	437	4.080	92.209	45.3
65	132.308	298.0	405	4.420	102.386	50.3
70	142.486	302.9	378	4.760	112.563	55.3
75	152.663	307.5	353	5.100	122.741	60.3
80	162.841	312.0	333	5.440	132.919	65.3
85	173.018	316.1	314	5.780	143.096	70.3
90	183.196	320.2	298	6.120	153.274	75.3
95	193.373	324.1	283	6.460	163.451	80.3
100	203.551	327.9	270	6.800	173.629	85.3
110	223.906	334.6	247	7.480	193.984	95.3
120	244.261	341.1	227	8.160	214.339	105.3
130	264.616	347.2	211	8.840	234.694	115.3
140	284.971	352.9	197	9.520	255.049	125.3
150	305.327	358.3	184	10.200	275.405	135.3
160	325.682	363.4	174	10.880	295.760	145.3
170	346.037	368.2	164	11.560	316.115	155.3
180	366.392	372.9	155	12.240	336.470	165.3
190	386.747	377.5	148	12.920	356.825	175.3
200	407.102	381.7	141	13.600	377.180	185.3
250	508.878	401.1	114	17.000	478.956	235.3
300	610.653	417.5	96	20.400	580.731	285.3
350	712.429	430.1	83	23.800	682.507	335.3
400	814.204	444.9	73	27.200	784.282	385.3
450	915.980	456.7	66	30.600	886.058	435.3
500	1017.755	467.5	59	34.000	987.833	485.3
600	1221.306	487.0	50	40.800	1191.384	585.3
700	1424.857	504.1	43	47.600	1394.935	685.3
800	1628.408	519.5	38	54.400	1598.486	785.3
900	1831.959	533.6	34	61.200	1802.037	885.3
1000	2035.510	546.5	31	68.000	2005.588	985.3

USEFUL INFORMATION.—Continued.

LIQUIDS, &c.—Molesworth—page 21.

	Specific Gravity.	Weight of a Cubic Foot.	Weight of a Cubic Inch.
Water distilled 39°	1	62.425	.036
“ Sea	1.027	64	.037
Acetic Acid	1.06	66	.038
Alcohol, Absolute	.792	49	.028
“ Proof	.916	57	.033
Ether	.716	45	.026
Hydrochloric Acid	1.2	75	.043
Nitric Acid	1.217	75	.044
Oil, Linseed	.94	58	.034
“ Olive	.915	57	.033
“ Whale	.923	58	.033
Sulphuric Acid	1.84	115	.066

GASES, &c.

Air	.001293	.08072	.00004655
Carbonic Acid	.00197	.123	.000071
Hydrogen	.0000895	.0056	.0000032
Nitrogen	.00125	.078	.000045
Olefiant Gas	.00127	.079	.000046
Oxygen	.00143	.089	.000051
Steam	.00088	.055	.0000317

WEIGHT OF METALS.

WROUGHT IRON.—Molesworth—page 36.

Cubic inches \times .28 = lbs. avoirdupois.“ \div 100 = qrs.“ \div 400 = cwt.Thickness of plates in inches \times 40 = lbs. per square ft.“ “ in eighths \times 5 = “ ““ “ in tenths \times 4 = “ “Sectional area in inches \times 3.34 = lbs. per lineal ft.“ “ in eighths \times .052 = “ ““ “ in inches \times 10 = lbs. per lineal yard.Pounds per lineal yard \times .7857 = tons per mile run.Diameter of round iron in inches squared \times 2.64 = lbs. per ft. run.

USEFUL INFORMATION.—Continued.

VARIOUS METALS.—Molesworth—page 36.

MULTIPLIERS TO CONVERT THE WEIGHTS AS FOUND ON PRECEDING PAGE INTO THE WEIGHTS OF OTHER METALS.

Weight of wrought iron $\times .92$ = weight of zinc." " $\times .93$ = " cast iron." " $\times .94$ = " tin." " $\times 1.04$ = " steel." " $\times 1.09$ = " brass." " $\times 1.15$ = " copper." " $\times 1.47$ = " lead.Cube inches " $\times .252$ = lbs. of zinc." " $\times .26$ = " cast iron." " $\times .262$ = " tin." " $\times .288$ = " steel." " $\times .3$ = " brass." " $\times .32$ = " copper." " $\times .41$ = " lead.

A bar of wrought iron 1 x 1 and 1 yard long weighs 10 lbs.

STRENGTH AND WEIGHT OF METALS.

Molesworth—page 16.

	Specific Gravity.	Weight of a Cubic Foot.	Weight of a Cubic Inch.	Tensile Strength per Square Inch.	Crushing Weight per Square Inch.	Transverse Strength.
Aluminium, Sheet.....	2.67	166.6	.096	.....	.....	.....
" Cast.....	2.56	159.8	.092	.....	.....	.....
Antimony, Cast.....	6.72	419.5	.242	.47	.....	.....
Bismuth, Cast.....	9.822	613.1	.353	1.45	.....	.....
Copper Bolts.....	8.85	552.4	.318	17	.....	.....
" Cast.....	8.607	537.3	.31	8.4	.....	.....
" Sheet.....	8.78	548.1	.316	13.4	.....	.....
" Wire.....	8.9	555	.32	26	.....	.....
Gold.....	18.417	1150	.665	9.1	.....	.....
Iron, Cast, from.....	7	437	.252	6	36	2
" " to.....	7.6	474.4	.273	13	64	3.4
" " average.....	7.23	451	.26	7.3	48	2.6
" Wrought, from.....	7.6	474.4	.273	16	16	3
" " to.....	7.8	486.9	.281	29	18	5.5
" " average....	7.78	485.6	.28	22	16.9	3.8
" Wire.....	.....	.....	.....	40	.....	.....
Lead, Cast.....	11.36	708.5	.408	.8	3.1	.....
" Sheet.....	11.4	711.6	.41	1.5	.....	.....
Mercury.....	13.596	848.75	.48945	.....	.....	.....
Platinum.....	21.531	1343.9	.775	.....	.....	.....
" Sheet.....	23	1435.6	.828	.....	.....	.....
Silver.....	10.474	653.8	.377	18.2	.....	.....
Steel.....	8	499	.288	52	150	.....
" Plates.....	.....	.....	.....	35	90	.....
Tin, Cast.....	7.291	455.1	.262	2.0	6.7	.....
Zinc, ".....	7	437	.252	3.3	.....	.....

USEFUL INFORMATION.—Continued.

SURVEYING MEASURE (Lineal).

Inches.	Links.	Feet.	Yards.	Chains.	Mile.	French Metrè.
1	.126	.0833	.0278	.00126	.0000158	.0254
7.92	1	.66	.22	.01	.000125	.2012
12	1.515	1	.333	.01515	.000189	.3048
36	4.545	3	1	.04545	.000568	.9144
792	100	66	22	1	.0125	.20.116
63360	8000	5280	1760	80	1.	1609.315

1 knot or geographical mile = 6082.66 feet = 1854 metrè = 1.152 statute mile.

1 admiralty knot = 1.1515 mile = 6080 feet.

SQUARE MEASURE.

Inches.	Feet.	Yards.	Perches.	Roods.	Acre.	Square Metrè.
1	.00694	.000772	.0000255	.00000064	.000000159	.000645
144	1	.111	.00367	.000918	.000023	.0929
1296	9	1	.0331	.000826	.0002062	.8361
39204	272 $\frac{1}{4}$	30 $\frac{1}{4}$	1	.025	.00625	25.292
1568160	10890	1210	40	1	.25	1011.7
6272640	43560	4840	160	4	1	4046.7

1 chain wide = 8 acres per mile.

10 square chains = 1 acre.

1 hectare = 2.471143 acres.

1 square mile { = 27878400 sq. feet.

1 square mile { = 3097600 sq. yards.

{ = 640 acres.

Acres x .0015625 = sq. miles.

Sq. yds. x .000000323 = sq. miles.

CUBIC MEASURE.

Inches.	Feet.	Yard.	Cubic Metrè or Stere.
1	.0005788	.000002144	.0000016386
1728	1	.03704	.028315
46656	27	1	.764513

WINE MEASURE.

Pints.

2 = 1 quart.

8 = 4 = 1 gallon.

336 = 168 = 42 = 1 tierce.

504 = 252 = 63 = 1 $\frac{1}{2}$ = 1 hogshead.672 = 336 = 84 = 2 = 1 $\frac{1}{3}$ = 1 puncheon.1008 = 504 = 126 = 3 = 2 = 1 $\frac{1}{2}$ = 1 pipe.

2016 = 1008 = 252 = 6 = 4 = 3 = 2 = 1 tun.

USEFUL INFORMATION.—Continued.

ALE AND BEER MEASURE.

Pints.

2	=	1 quart.
8	=	4 = 1 gallon.
72	=	36 = 9 = 1 firkin.
144	=	72 = 18 = 2 = 1 kilderkin.
288	=	144 = 36 = 4 = 2 = 1 barrel.
432	=	216 = 54 = 6 = 3 = 1½ = 1 hogshead.
576	=	288 = 72 = 8 = 4 = 2 = 1½ = 1 puncheon.
864	=	432 = 108 = 12 = 6 = 3 = 2 = 1½ = 1 butt.

MEASURE OF CAPACITY.

Pints.	Gal.	Peck.	Bushel.	Quarter.	Wey.	Last.	Cub. ft.	Litres.
1	= .125	= .0625	= .01562	= .00195	= .00039	= .000195	= .020051	= .5679
8	= 1	= .5	= .125	= .0156	= .00312	= .00156	= .16046	= 4.543
16	= 2	= 1	= .25	= .03125	= .00625	= .00312	= .32092	= 9.087
64	= 8	= 4	= 1	= .125	= .025	= .0125	= 1.28367	= 36.34766
512	= 64	= 32	= 8	= 1	= .2	= .1	= 10.269	= 290.781
2560	= 320	= 160	= 40	= 5	= 1	= .5	= 51.347	= 1453.906
5120	= 640	= 320	= 80	= 10	= 2	= 1	= 102.69	= 2907.81

1 gallon in wine, ale, or dry measure.

= 277.27384 cubic inches = .16 cubic foot.

= 10 lbs. of distilled water.

Cube feet x 6.2355 = gallons.

Cube ins. x .003607 = gallons.

1 bushel = 2218.19 cube inches = 1.28 cube foot.

Cube feet x .78 = bushels.

Cube ins. x .00045 = bushels.

WEIGHTS AND MEASURES.

AVOIRDUPois WEIGHT.

Drachms.	Ozs.	Lbs.	Qrs.	Cwts.	Ton.	French Grammes.
1	= .0625	= .0039	= .000139	= .000035	= .00000174	= 1.771846
16	= 1	= .0625	= .00223	= .000558	= .000028	= 28.34954
256	= 16	= 1	= .0357	= .00893	= .000447	= 453.59
7168	= 448	= 28	= 1	= .25	= .0125	= 12,700
28672	= 1792	= 112	= 4	= 1	= .05	= 50,802
573440	= 35840	= 2240	= 80	= 20	= 1	= 1,016,048

TROY WEIGHT.

Grains.	Dwts.	Ozs.	Lb.	French Grammes.
1	= .04167	= .00208	= .0001736	= .0648
24	= 1	= .05	= .004167	= 1.555
480	= 20	= 1	= .0833	= 31.1035
5760	= 240	= 12	= 1	= 373.242

175 lbs. troy = 144 lbs. avoirdupois.

Lbs. avoirdupois x 1.2153 = lbs. troy.

Lbs. troy x .82286 = lbs. avoirdupois.

USEFUL INFORMATION.—Continued.

LONG MEASURE.

In.	Feet.	Yards.	Fath.	Poles.	Furl.	Mile.	French Metrēs.
1 =	.083	= .02778	= .0139	= .005	= .000126	= .0000158	= .0254
12 =	1	= .333	= .1667	= .0606	= .00151	= .0001894	= .3048
36 =	3	= 1	= .5	= .182	= .00454	= .000568	= .9144
72 =	6	= 2	= 1	= .364	= .0091	= .001136	= 1.8287
198 =	16½	= 5½	= 2¾	= 1	= .025	= .003125	= 5.0291
7920 =	660	= 220	= 110	= 40	= 1	= .125	= 201.16
63360 =	5280	= 1760	= 880	= 320	= 8	= 1	= 1609.315

PROPERTIES OF THE CIRCLE.

Diameter .. \times 3.14159 = circumference.
 Diameter .. \times .886226 = side of an equal square.
 Diameter .. \times .7071 = side of an inscribed square.
 Diameter² .. \times .7854 = area of circle.
 Radius .. \times 6.28318 = circumference.
 Circumference \times .31831 = diameter.
 Circumference = $3.5449 \sqrt{\text{area of circle}}$.
 Diameter .. = $1.1283 \sqrt{\text{area of circle}}$.

Molesworth—page 633.

MENSURATION OF SURFACES.

Area of triangle .. = Base \times $\frac{1}{2}$ perpendicular.
 " circle .. = Diameter² \times .7854.
 Area of sector of circle = Length of arc \times $\frac{1}{2}$ radius.
 " " " " =
 Number of degrees in arc \times area of the circle.
 $\frac{360}{}$

Area of parabola .. = Base \times $\frac{2}{3}$ height.

$$\text{Frustum of a parabola} = \frac{\text{base}^3 - \text{top}^3}{\text{base}^2 - \text{top}^2}$$

Area of ellipse .. = Transverse axis \times .7854 conjugate axis.
 " cycloid .. = Area of generating circle \times 3.
 Surface of cylinder = Area of both ends + length \times circumference.
 " cone = Area of base + circumference of base \times $\frac{1}{2}$ slant height.
 " sphere = Diameter² \times 3.1415.
 " frustum = Sum of girt at both ends \times $\frac{1}{2}$ slant height + area of both ends.

SEGMENT AREAS.

The area of a segment = Area of a sector — $\frac{1}{2}$ chord \times (radius — versin).Area of a segment of circle = Diameter² \times x .
$$\frac{V}{D} = \text{The versed sine divided by the diameter of the circle of which the segment is a part.}$$

Molesworth—page 656.

USEFUL INFORMATION.—Continued.

MENSURATION OF SOLIDS.

Cylinder = Area of one end X length.

Sphere = Diameter³ X 0.5236.Segment of sphere = 0.5236 H (H² + 3 R²), where H = height of segment and R = radius of the base of the segment.Cone or pyramid = Area of base x $\frac{1}{3}$ perpendicular height.Frustum = $\frac{1}{3}$ H (A + a + $\sqrt{A \times a}$) When A and a = areas of the ends, H = perpendicular height.Frustum of cone = 0.2618 H (D² + d² + D.d.) When D and d = the diameters of each end, H = perpendicular height.Wedge = Area of base x $\frac{1}{2}$ perpendicular height.Frustum of wedge = $\frac{1}{2}$ H (A + a), when A and a = area at each end, H = perpendicular height.

Molesworth—page 657.

USEFUL MEMORANDA FOR HYDRAULIC CALCULATIONS.

1 cubic foot of water = 62.425 lbs. = .557 cwt. = .028 ton.

1 cubic inch = .03612 lb.

1 gallon (English) = 10 lbs. = .16 cube feet.

1 cube foot of water = 6.24 gallons = say 6 $\frac{1}{4}$ gallons.

1 gallon (U. S.) = 8.3456 lbs. = 13368 cube foot.

1 cube foot of water = 7.4805 gallons = nearly 7 $\frac{1}{2}$ gallons.

1 cwt. of water = 1.8 cube foot = 11.2 gallons.

1 ton of water = 35.9 cube feet = 224 gallons.

Molesworth—page 243.

To find the pressure per square inch a column of water of any height will exert. —Multiply the height of the column, in feet, by the weight of a cubic foot of water in pounds at the temperature the water may be, and divide by 144.

Example.—Required the pressure per square inch of a head of water of 200 feet, with the temperature of the water at 40° (weight 62 $\frac{1}{2}$ lbs.) Thus, 200 x 62.5 = 12500 \div 144 = 86.8 lbs. per square inch. Required the pressure of the water at a temperature of 212. Thus, 200 x 59.80 = 1196 \div 144 = 83.05 lbs. per square inch.

From "Baldwin's Steam Heating for Buildings."

USEFUL MEMORANDA FOR PUMPS.

G = Number of gallons to be raised in 24 hours.

F = Number of cube feet raised in 24 hours.

h = Height in feet to which the water is to be raised.

H P = Actual horse power required.

$$H P = \frac{G \times h}{4752000} \text{ or } \frac{F \times h}{762088}$$

Twenty per cent. must be added to overcome a friction, &c., and 50 or 60 per cent. more is usually allowed for contingencies, making a total of 70 or 80 per cent. additional power.

USEFUL INFORMATION.—Continued.

USEFUL MEMORANDA FOR PUMPS.—Continued.

TO FIND THE DIAMETER OF A SINGLE-ACTING PUMP.

L = Length of stroke in feet.

G = Number of gallons to be delivered per minute.

F = Number of cube feet to be delivered per minute.

N = Number of strokes per minute.

D = Diameter of pump in inches.

F = .00545 D² L N.G = .034 D² L N.

$$D = \sqrt{\frac{G}{.034 L N}}$$

$$D = \sqrt{\frac{F}{.00545 L N}}$$

NOTE.—These formulæ give the net diameter of the pump-plunger; it is usual to increase the area of the plunger one-fourth, to allow for leakage, &c.

USEFUL NUMBERS FOR PUMPS.

D = Diameter of pump in inches.

S = Stroke of pump in inches.

D.² S x .7854 = cubic inches.D.² S x .002833 = gallons.D.² S x .0004545 = cubic feet.D.² S x .02833 = lbs. fresh water.

Molesworth—page 283

RULE FOR THE WEIGHT OF PIPES.

D = Outside diameter of pipe in inches.

d = Inside diameter.

w = Weight of a lineal foot of pipe in lbs.

w = k (D² — d²).

k = 2.45 for cast iron.

= 2.64 for wrought iron.

= 2.82 for brass.

= 3.03 for copper.

= 3.86 for lead.

WEIGHT OF CAST IRON PIPES,

IN LBS. PER LINEAL FOOT. THE WEIGHT OF THE TWO FLANGES MAY BE RECKONED = WEIGHT OF ONE FOOT.

Bore. Inches.	Thickness of Metal.							
	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4
2	8.7	12.3	16.1					
3	12.4	17.1	22.2					
4	16.1	22.1	28.3					
5	19.8	26.9	34.4	42.3				
6	23.4	31.9	40.6	49.7				
7	27.1	36.8	46.7	56.8				
8	30.8	41.6	52.8	64.3				
9	34.4	46.0	58.9	71.7				
10	.....	51.4	65.1	79	93.3			
11	.....	56.4	71	86.4	101.8			
12	.....	.....	77.3	93.7	110.4	127.4		
14	.....	.....	89.6	108.4	127.5	147		
15	.....	.....	.....	115.7	136.1	156.8	177.7	
16	.....	.....	.....	123.1	144.7	166.6	188.7	
18	.....	.....	.....	137.9	161.8	186.2	210.8	
20	.....	.....	.....	.....	178.9	205.8	232.9	260.3
22	.....	.....	.....	.....	.....	225.4	254.9	284.8
24	.....	.....	.....	.....	.....	245.0	276.9	309.3

Molesworth—page 46.

USEFUL INFORMATION—Continued.

WEIGHT OF ROUND AND SQUARE COPPER RODS
IN LBS. PER LINEAL FOOT.

Size of Rod.	Weight per Lineal Foot.		Size of Rod.	Weight per Lineal Foot.		Size of Rod.	Weight per Lineal Foot.	
	Round.	Square.		Round.	Square.		Round.	Square.
$\frac{1}{4}$	0.19	0.24	$1\frac{1}{16}$	3.86	4.91	2	12.20	15.53
$\frac{5}{16}$	0.30	0.38	$1\frac{3}{16}$	4.30	5.47	$2\frac{1}{16}$	12.97	16.51
$\frac{3}{8}$	0.43	0.55	$1\frac{1}{4}$	4.77	6.06	$2\frac{1}{8}$	13.77	17.53
$\frac{7}{16}$	0.58	0.74	$1\frac{5}{16}$	5.25	6.68	$2\frac{3}{16}$	14.60	18.58
$\frac{1}{2}$	0.76	0.97	$1\frac{3}{8}$	5.77	7.34	$2\frac{1}{4}$	15.44	19.65
$\frac{9}{16}$	0.96	1.23	$1\frac{7}{16}$	6.30	8.02	$2\frac{5}{16}$	16.31	20.76
$\frac{5}{8}$	1.19	1.52	$1\frac{1}{2}$	6.86	8.73	$2\frac{3}{8}$	17.20	21.90
$\frac{11}{16}$	1.44	1.83	$1\frac{9}{16}$	7.45	9.48	$2\frac{7}{16}$	18.12	23.06
$\frac{3}{4}$	1.72	2.18	$1\frac{5}{8}$	8.05	10.25	$2\frac{1}{2}$	19.06	24.26
$\frac{13}{16}$	2.01	2.56	$1\frac{11}{16}$	8.69	11.05	$2\frac{5}{8}$	21.02	26.75
$\frac{7}{8}$	2.33	2.97	$1\frac{3}{4}$	9.34	11.89	$2\frac{3}{4}$	23.07	29.36
$\frac{15}{16}$	2.68	3.41	$1\frac{13}{16}$	10.02	12.75	$2\frac{7}{8}$	25.21	32.09
I	3.05	3.88	$1\frac{7}{8}$	10.72	13.65	3	27.45	34.94
$1\frac{1}{16}$	3.44	4.38	$1\frac{15}{16}$	11.45	14.57			

Molesworth—page 47.

SIZES AND WEIGHT OF SHEET TIN.

Mark.	No. of Sheets in a Box.	Dimensions.		Weight of a Box.		
		Length.	Breadth.	Cwts.	Qrs.	Lbs.
I C	225	$13\frac{3}{4}$	10	I	0	0
Hx	225	$13\frac{3}{4}$	10	I	I	7
IX	225	$13\frac{3}{4}$	10	I	I	0
Ixx	225	$13\frac{3}{4}$	10	I	I	21
Ixxx	225	$13\frac{3}{4}$	10	I	2	14
IXXX	225	$13\frac{3}{4}$	10	I	3	7
D C	100	$16\frac{3}{4}$	$12\frac{1}{2}$	0	3	21
Dx	100	$16\frac{3}{4}$	$12\frac{1}{2}$	I	0	14
Dxx	100	$16\frac{3}{4}$	$12\frac{1}{2}$	I	I	7
Dxxx	100	$16\frac{3}{4}$	$12\frac{1}{2}$	I	2	0
Dxxxx	100	$16\frac{3}{4}$	$12\frac{1}{2}$	I	2	21
S D C	200	15	II	I	2	0
S Dx	200	15	II	I	2	21
S Dxx	200	15	II	I	3	14
S Dxxx	200	15	II	2	0	7
S Dxxxx	200	15	II	2	I	0

Molesworth—page 45.

USEFUL INFORMATION.—Continued.

CIRCUMFERENCES OF CIRCLES, ADVANCING BY EIGHTHS.

Diam.	Circumferences.								Diam.
	.0	.1/8	.1/4	.3/8	.1/2	.5/8	.3/4	.7/8	
0	.0	.3927	.7854	1.178	1.570	1.963	2.356	2.748	0
1	3.141	3.534	3.927	4.319	4.712	5.105	5.497	5.890	1
2	6.283	6.675	7.068	7.461	7.854	8.246	8.639	9.032	2
3	9.424	9.817	10.21	10.60	10.99	11.38	11.78	12.17	3
4	12.56	12.95	13.35	13.74	14.13	14.52	14.92	15.31	4
5	15.70	16.10	16.49	16.88	17.27	17.67	18.06	18.45	5
6	18.84	19.24	19.63	20.02	20.42	20.81	21.20	21.59	6
7	21.99	22.38	22.77	23.16	23.56	23.95	24.34	24.74	7
8	25.13	25.52	25.91	26.31	26.70	27.09	27.48	27.88	8
9	28.27	28.66	29.05	29.45	29.84	30.23	30.63	31.02	9
10	31.41	31.80	32.20	32.59	32.98	33.37	33.77	34.16	10
11	34.55	34.95	35.34	35.73	36.12	36.52	36.91	37.30	11
12	37.69	38.09	38.48	38.87	39.27	39.66	40.05	40.44	12
13	40.84	41.23	41.62	42.01	42.41	42.80	43.19	43.58	13
14	43.98	44.37	44.76	45.16	45.55	45.94	46.33	46.73	14
15	47.12	47.51	47.90	48.30	48.69	49.08	49.48	49.87	15
16	50.26	50.65	51.05	51.44	51.83	52.22	52.62	53.01	16
17	53.40	53.79	54.19	54.58	54.97	55.37	55.76	56.15	17
18	56.54	56.94	57.33	57.72	58.11	58.51	58.90	59.29	18
19	59.69	60.08	60.47	60.86	61.26	61.65	62.04	62.43	19
20	62.83	63.22	63.61	64.01	64.40	64.79	65.18	65.58	20
21	65.97	66.36	66.75	67.15	67.54	67.93	68.32	68.72	21
22	69.11	69.50	69.90	70.29	70.68	71.07	71.47	71.86	22
23	72.25	72.64	73.04	73.43	73.82	74.22	74.61	75.00	23
24	75.39	75.79	76.18	76.57	76.96	77.36	77.75	78.14	24
25	78.54	78.93	79.32	79.71	80.10	80.50	80.89	81.28	25
26	81.68	82.07	82.46	82.85	83.25	83.64	84.03	84.43	26
27	84.82	85.21	85.60	86.00	86.39	86.78	87.17	87.57	27
28	87.96	88.35	88.75	89.14	89.53	89.92	90.32	90.71	28
29	91.10	91.49	91.89	92.28	92.67	93.06	93.46	93.85	29
30	94.24	94.64	95.03	95.42	95.81	96.21	96.60	96.99	30
31	97.4	97.8	98.2	98.6	99.0	99.4	99.7	100.1	31
32	100.5	100.9	101.3	101.7	102.1	102.5	102.9	103.3	32
33	103.7	104.1	104.5	104.9	105.2	105.6	106.0	106.4	33
34	106.8	107.2	107.6	108.0	108.4	108.8	109.2	109.6	34
35	110.0	110.3	110.7	111.1	111.5	111.9	112.3	112.7	35
36	113.1	113.5	113.9	114.3	114.7	115.1	115.5	115.8	36
37	116.2	116.6	117.0	117.4	117.8	118.2	118.6	119.0	37
38	119.4	119.8	120.2	120.6	121.0	121.3	121.7	122.1	38
39	122.5	122.9	123.3	123.7	124.1	124.5	124.9	125.3	39
40	125.7	126.1	126.4	126.8	127.2	127.6	128.0	128.4	40
41	128.8	129.2	129.6	130.0	130.4	130.8	131.2	131.6	41
42	131.9	132.3	132.7	133.1	133.5	133.9	134.3	134.7	42
43	135.1	135.5	135.9	136.3	136.7	137.1	137.4	137.8	43
44	138.2	138.6	139.0	139.4	139.8	140.2	140.6	141.0	44
45	141.4	141.8	142.2	142.6	142.9	143.3	143.7	144.1	45
46	144.5	144.9	145.3	145.7	146.1	146.5	146.9	147.3	46
47	147.7	148.0	148.4	148.8	149.2	149.6	150.0	150.4	47
48	150.8	151.2	151.6	152.0	152.4	152.8	153.2	153.5	48
49	153.9	154.3	154.7	155.1	155.5	155.9	156.3	156.7	49
50	157.1	157.5	157.9	158.3	158.7	159.0	159.4	159.8	50
51	160.2	160.6	161.0	161.4	161.8	162.2	162.6	163.0	51
52	163.4	163.8	164.1	164.5	164.9	165.3	165.7	166.1	52
53	166.5	166.9	167.3	167.7	168.1	168.5	168.9	169.3	53
54	169.6	170.0	170.4	170.8	171.2	171.6	172.0	172.4	54
55	172.8	173.2	173.6	174.0	174.4	174.8	175.1	175.5	55

USEFUL INFORMATION.—Continued.

CIRCUMFERENCES OF CIRCLES, ADVANCING BY EIGHTHS.—Continued.

Diam.	Circumferences.								Diam.
	.0	.1/8	.1/4	.3/8	.1/2	.5/8	.3/4	.7/8	
56	175.9	176.3	176.7	177.1	177.5	177.9	178.3	178.7	56
57	179.1	179.5	179.9	180.2	180.6	181.0	181.4	181.8	57
58	182.2	182.6	183.0	183.4	183.8	184.2	184.6	185.0	58
59	185.4	185.7	186.1	186.5	186.9	187.3	187.7	188.1	59
60	188.5	188.9	189.3	189.7	190.1	190.5	190.9	191.2	60
61	191.6	192.0	192.4	192.8	193.2	193.6	194.0	194.4	61
62	194.8	195.2	195.6	196.0	196.4	196.7	197.1	197.5	62
63	197.9	198.3	198.7	199.1	199.5	199.9	200.3	200.7	63
64	201.1	201.5	201.8	202.2	202.6	203.0	203.4	203.8	64
65	204.2	204.6	205.0	205.4	205.8	206.2	206.6	207.0	65
66	207.3	207.7	208.1	208.5	208.9	209.3	209.7	210.1	66
67	210.5	210.9	211.3	211.7	212.1	212.5	212.8	213.2	67
68	213.6	214.0	214.4	214.8	215.2	215.6	216.0	216.4	68
69	216.8	217.2	217.6	217.9	218.3	218.7	219.1	219.5	69
70	219.9	220.3	220.7	221.1	221.5	221.9	222.3	222.7	70
71	223.1	223.4	223.8	224.2	224.6	225.0	225.4	225.8	71
72	226.2	226.6	227.0	227.4	227.8	228.2	228.6	228.9	72
73	229.3	229.7	230.1	230.5	230.9	231.3	231.7	232.1	73
74	232.5	232.9	233.3	233.7	234.0	234.4	234.8	235.2	74
75	235.6	236.0	236.4	236.8	237.2	237.6	238.0	238.4	75
76	238.8	239.2	239.5	239.9	240.3	240.7	241.1	241.5	76
77	241.9	242.3	242.7	243.1	243.5	243.9	244.3	244.7	77
78	245.0	245.4	245.8	246.2	246.6	247.0	247.4	247.8	78
79	248.2	248.6	249.0	249.4	249.8	250.1	250.5	250.9	79
80	251.3	251.7	252.1	252.5	252.9	253.3	253.7	254.1	80
81	254.5	254.9	255.3	255.6	256.0	256.4	256.8	257.2	81
82	257.6	258.0	258.4	258.8	259.2	259.6	260.0	260.4	82
83	260.8	261.1	261.5	261.9	262.3	262.7	263.1	263.5	83
84	263.9	264.3	264.7	265.1	265.5	265.9	266.3	266.6	84
85	267.0	267.4	267.8	268.2	268.6	269.0	269.4	269.8	85
86	270.2	270.6	271.0	271.4	271.7	272.1	272.5	272.9	86
87	273.3	273.7	274.1	274.5	274.9	275.3	275.7	276.1	87
88	276.5	276.9	277.2	277.6	278.0	278.4	278.8	279.2	88
89	279.6	280.0	280.4	280.8	281.2	281.6	282.0	282.4	89
90	282.7	283.1	283.5	283.9	284.3	284.7	285.1	285.5	90
91	285.9	286.3	286.7	287.1	287.5	287.8	288.2	288.6	91
92	289.0	289.4	289.8	290.2	290.6	291.0	291.4	291.8	92
93	292.2	292.6	293.0	293.3	293.7	294.1	294.5	294.9	93
94	295.3	295.7	296.1	296.5	296.9	297.3	297.7	298.1	94
95	298.5	298.8	299.2	299.6	300.0	300.4	300.8	301.2	95
96	301.6	302.0	302.4	302.8	303.2	303.6	303.9	304.3	96
97	304.7	305.1	305.5	305.9	306.3	306.7	307.1	307.5	97
98	307.9	308.3	308.7	309.1	309.4	309.8	310.2	310.6	98
99	311.0	311.4	311.8	312.2	312.6	313.0	313.4	313.8	99

USEFUL INFORMATION.—Continued.

AREAS OF CIRCLES, ADVANCING BY EIGHTHS.

Diam.	Areas.								Diam.
	.0	.1/8	.1/4	.3/8	.1/2	.5/8	.3/4	.7/8	
0	.0	.0122	.0490	.1104	.1963	.3068	.4417	.6013	0
1	.7854	.9940	1.227	1.484	1.767	2.073	2.405	2.761	1
2	3.141	3.546	3.976	4.430	4.908	5.411	5.939	6.491	2
3	7.068	7.669	8.295	8.946	9.621	10.32	11.04	11.79	3
4	12.56	13.36	14.18	15.03	15.90	16.80	17.72	18.66	4
5	19.63	20.62	21.64	22.69	23.75	24.85	25.96	27.10	5
6	28.27	29.46	30.67	31.91	33.18	34.47	35.78	37.12	6
7	38.48	39.87	41.28	42.71	44.17	45.66	47.17	48.70	7
8	50.26	51.84	53.45	55.08	56.74	58.42	60.13	61.86	8
9	63.61	65.39	67.20	69.02	70.88	72.75	74.86	76.58	9
10	78.54	80.51	82.51	84.54	86.59	88.66	90.76	92.88	10
11	95.03	97.20	99.40	101.6	103.8	106.1	108.4	110.7	11
12	113.0	115.4	117.8	120.2	122.7	125.1	127.6	130.1	12
13	132.7	135.2	137.8	140.5	143.1	145.8	148.4	151.2	13
14	153.9	156.6	159.4	162.2	165.1	167.9	170.8	173.7	14
15	176.7	179.6	182.6	185.6	188.6	191.7	194.8	197.9	15
16	201.0	204.2	207.3	210.5	213.8	217.0	220.3	223.6	16
17	226.9	230.3	233.7	237.1	240.5	243.9	247.4	250.9	17
18	254.4	258.0	261.5	265.1	268.8	272.4	276.1	279.8	18
19	283.5	287.2	291.0	294.8	298.6	302.4	306.3	310.2	19
20	314.1	318.1	322.0	326.0	330.0	334.1	338.1	342.2	20
21	346.3	350.4	354.6	358.8	363.0	367.2	371.5	375.8	21
22	380.1	384.4	388.8	393.2	397.6	402.0	406.4	410.9	22
23	415.4	420.0	424.5	429.1	433.7	438.3	443.0	447.6	23
24	452.3	457.1	461.8	466.6	471.4	476.2	481.1	485.9	24
25	490.8	495.7	500.7	505.7	510.7	515.7	520.7	525.8	25
26	530.9	536.0	541.1	546.3	551.5	556.7	562.0	567.2	26
27	572.5	577.8	583.2	588.5	593.9	599.3	604.8	610.2	27
28	615.7	621.2	626.7	632.3	637.9	643.5	649.1	654.8	28
29	660.5	666.2	671.9	677.7	683.4	689.2	695.1	700.9	29
30	706.8	712.7	718.6	724.6	730.6	736.6	742.6	748.6	30
31	754.8	760.9	767.0	773.1	779.3	785.5	791.7	798.0	31
32	804.2	810.5	816.9	823.2	829.6	836.0	842.4	848.8	32
33	855.3	861.8	868.3	874.8	881.4	888.0	894.6	901.3	33
34	907.9	914.6	921.3	928.1	934.8	941.6	948.4	955.3	34
35	962.1	969.0	975.9	982.8	989.8	996.8	1003.8	1010.8	35
36	1017.9	1025.0	1032.1	1039.2	1046.4	1053.5	1060.7	1068.0	36
37	1075.2	1082.5	1089.8	1097.1	1104.5	1111.8	1119.2	1126.7	37
38	1134.1	1141.6	1149.1	1156.6	1164.2	1171.7	1179.3	1186.9	38
39	1194.6	1202.3	1210.0	1217.7	1225.4	1233.2	1241.0	1248.8	39
40	1256.6	1264.5	1272.4	1280.3	1288.3	1296.2	1304.2	1312.2	40
41	1320.3	1328.3	1336.4	1344.5	1352.7	1360.8	1369.0	1377.2	41
42	1385.4	1393.7	1402.0	1410.3	1418.6	1427.0	1435.4	1443.8	42
43	1452.2	1460.7	1469.1	1477.6	1486.2	1494.7	1503.3	1511.9	43
44	1520.5	1529.2	1537.9	1546.6	1555.3	1564.0	1572.8	1581.6	44
45	1590.4	1599.3	1608.2	1617.0	1626.0	1634.9	1643.9	1652.9	45
46	1661.9	1671.0	1680.0	1689.1	1698.2	1707.4	1716.5	1725.7	46
47	1734.9	1744.2	1753.5	1762.7	1772.1	1781.4	1790.8	1800.1	47
48	1809.6	1819.0	1828.5	1837.9	1847.5	1857.0	1866.6	1876.1	48
49	1885.7	1895.4	1905.0	1914.7	1924.4	1934.2	1943.9	1953.7	49
50	1963.5	1973.3	1983.2	1993.1	2003.0	2012.9	2022.8	2032.8	50
51	2042.8	2052.9	2062.9	2073.0	2083.1	2093.2	2103.4	2113.5	51
52	2123.7	2133.9	2144.2	2154.5	2164.8	2175.1	2185.4	2195.8	52
53	2206.2	2216.6	2227.1	2237.5	2248.0	2258.5	2269.1	2279.6	53
54	2290.2	2300.8	2311.5	2322.1	2332.8	2343.5	2354.3	2365.0	54
55	2375.8	2386.6	2397.5	2408.3	2419.2	2430.2	2441.1	2452.0	55

USEFUL INFORMATION.—Continued.

AREAS OF CIRCLES, ADVANCING BY EIGHTHS.—Continued.

Diam.	Areas.								Diam.
	.0	.1/8	.1/4	.3/8	.1/2	.5/8	.3/4	.7/8	
56	2463.0	2474.0	2485.1	2496.1	2507.2	2518.3	2529.4	2540.6	56
57	2551.8	2563.0	2574.2	2585.5	2596.7	2608.0	2619.4	2630.7	57
58	2642.1	2653.5	2664.9	2676.4	2687.8	2699.3	2710.9	2722.4	58
59	2734.0	2745.6	2757.2	2768.8	2780.5	2792.2	2803.9	2815.7	59
60	2827.4	2839.2	2851.1	2862.9	2874.8	2886.7	2898.6	2910.5	60
61	2922.5	2934.5	2946.5	2958.5	2970.6	2982.7	2994.8	3006.9	61
62	3019.1	3031.3	3043.5	3055.7	3068.0	3080.3	3092.6	3104.9	62
63	3117.3	3129.6	3142.0	3154.5	3166.9	3179.4	3191.9	3204.4	63
64	3217.0	3229.6	3242.2	3254.8	3267.5	3280.1	3292.8	3305.6	64
65	3318.3	3331.1	3343.9	3356.7	3369.6	3382.4	3395.3	3408.3	65
66	3421.2	3434.2	3447.2	3460.2	3473.2	3486.3	3499.4	3512.5	66
67	3525.7	3538.8	3552.0	3565.2	3578.5	3591.7	3605.0	3618.4	67
68	3631.7	3645.1	3658.5	3671.9	3685.3	3698.8	3712.2	3725.8	68
69	3739.3	3752.8	3766.4	3780.0	3793.7	3807.3	3821.0	3834.7	69
70	3848.5	3862.2	3876.0	3889.8	3903.6	3917.5	3931.4	3945.3	70
71	3959.2	3973.2	3987.1	4001.1	4015.2	4029.2	4043.3	4057.4	71
72	4071.5	4085.7	4099.8	4114.0	4128.3	4142.5	4156.8	4171.1	72
73	4185.4	4199.7	4214.1	4228.5	4242.9	4257.4	4271.8	4286.3	73
74	4300.9	4315.4	4330.0	4344.6	4359.2	4373.8	4388.5	4403.2	74
75	4417.9	4432.6	4447.4	4462.2	4477.0	4491.8	4506.7	4521.6	75
76	4536.5	4551.4	4566.4	4581.3	4596.4	4611.4	4626.4	4641.5	76
77	4656.6	4671.8	4686.9	4702.1	4717.3	4732.5	4747.8	4763.1	77
78	4778.4	4793.7	4809.1	4824.4	4839.8	4855.3	4870.7	4886.2	78
79	4901.7	4917.2	4932.8	4948.3	4963.9	4979.5	4995.2	5010.9	79
80	5026.6	5042.3	5058.0	5073.8	5089.6	5105.4	5121.2	5137.1	80
81	5153.0	5168.9	5184.9	5200.8	5216.8	5232.8	5248.9	5264.9	81
82	5281.0	5297.1	5313.3	5329.4	5345.6	5361.8	5378.1	5394.3	82
83	5410.6	5426.9	5443.3	5459.6	5476.0	5492.4	5508.8	5525.3	83
84	5541.8	5558.3	5574.8	5591.4	5608.0	5624.6	5641.2	5657.8	84
85	5674.5	5691.2	5707.9	5724.7	5741.5	5758.3	5775.1	5791.9	85
86	5808.8	5825.7	5842.6	5859.6	5876.6	5893.6	5910.6	5927.6	86
87	5944.7	5961.8	5978.9	5996.1	6013.2	6030.4	6047.6	6064.9	87
88	6082.1	6099.4	6116.7	6134.1	6151.4	6169.8	6186.3	6203.7	88
89	6221.2	6238.6	6256.2	6273.7	6291.3	6308.8	6326.4	6344.1	89
90	6361.7	6379.4	6397.1	6414.9	6432.6	6450.4	6468.2	6486.0	90
91	6503.9	6521.8	6539.7	6557.6	6575.6	6593.5	6611.5	6629.6	91
92	6647.6	6665.7	6683.8	6701.9	6720.1	6738.3	6756.5	6774.7	92
93	6792.9	6811.2	6829.5	6847.8	6866.2	6884.5	6902.9	6921.3	93
94	6939.8	6958.3	6976.8	6995.3	7013.8	7032.4	7051.0	7069.6	94
95	7088.2	7106.9	7125.6	7144.3	7163.0	7181.8	7200.6	7219.4	95
96	7238.2	7257.1	7276.0	7294.9	7313.8	7332.8	7351.8	7370.8	96
97	7389.8	7408.9	7428.0	7447.1	7466.2	7485.4	7504.5	7523.8	97
98	7543.0	7562.2	7581.5	7600.8	7620.1	7639.5	7658.9	7678.3	98
99	7697.7	7717.2	7736.6	7756.1	7775.7	7795.2	7814.8	7834.4	99

CONTENTS.

	PAGE
PIPE, WROUGHT AND CAST IRON, BRASS AND LEAD.....	5-11
BOILER TUBES.....	5
FITTINGS FOR WROUGHT IRON PIPE, CAST, MALLEABLE AND WROUGHT IRON.....	12-22
IRON COCKS, VALVES, ETC., BRASS MOUNTED.....	23-25
BRASS VALVES, COCKS, ETC.....	26-33
AIR, CYLINDER AND GAUGE COCKS.....	27
GAS COCKS AND SOLDERING FITTINGS.....	28
ENGINE AND BOILER TRIMMINGS.....	27-33
RADIATOR VALVES AND COCKS.....	30-31
OIL CUPS, LUBRICATORS, ETC.....	31-42
STEAM WHISTLES.....	32-33
BRASS PIPE AND FITTINGS.....	34
STEAM BIBBS AND STOPS.....	35
PATENT VALVES AND GATES.....	36-41
PICKERING GOVERNORS AND STEAM GAUGES.....	44, 45
INJECTORS, EJECTORS AND INSPIRATORS.....	46, 47
PIPE COILS AND SCREENS.....	48-50
FEED WATER HEATER AND AUTOMATIC FEEDERS.....	49, 50
STEAM KETTLES.....	51
STEAM DAMPER OR DRAFT REGULATOR.....	52, 115
BRASS GAS FIXTURES, FITTINGS AND BRACKETS.....	53-56
PUMPS FOR GARDENS, WELLS, &c.....	57-60
PLUMBERS' BRASS BIBBS, STOPS, &c.....	61-71
CAST IRON PIPE AND FITTINGS.....	72-78
TRAPS, HOPPERS, SINKS, &c.....	78-88
STEAM AND GAS FITTERS' TOOLS.....	89-101
TOOLS, OTHER.....	89-101
TURNBUCKLES, BOLTS, HAMMERS, CHISELS AND PULLEY BLOCKS.....	101-105
CONROW'S CONDENSER AND FORGE.....	105
BLOWERS, BARROWS, LAMPS AND OILER SETS.....	106-107
POP SAFETY VALVES, OIL PUMPS AND GAUGE GLASSES.....	107
SCRAPERS, JACKS, HANGERS, HOSE AND BELTING.....	108-110
ALL KINDS PACKING.....	111
NASON'S SPECIALTIES.	
BOILERS AND REGULATORS.....	112-116
VERTICAL TUBE RADIATORS.....	117-130
SCREENS, FANS, STEAM TRAPS.....	130-133
GLUE HEATERS AND BOILER FEED PUMPS.....	134-135
BOILER, PUMP, AND BASE.....	136-138
WORTHINGTON STEAM PUMPS AND WATER METERS.....	139-142
AUTOMATIC WATER FEEDERS AND ELEVATOR VALVES.....	143-144
PIPE VISE AND FOOT RAIL FITTINGS.....	145-147
AMMONIA FITTINGS, VALVES, &c.....	148-150

INDEX.

A

	PAGE
Acorn End Piece.....	146
Air Cocks.....	27
Air Cocks, Radiator.....	30
Air Valves.....	31
Ammonia Gauge.....	148
Ammonia Strainer.....	150
Ammonia Valves and Fittings.....	148
Angle Pipe Vise.....	94
Angle Valves, I. B.....	25
Angle Valves, Brass.....	26
Anti-Freezing Well Pumps.....	58
Armstrong's Stock and Dies.....	94
Ashcroft Steam Gauges.....	45
Attachment for Threading Bolts and Tapping Nuts.....	90
Augers, Gas Fitters.....	100
Automatic Air Valves.....	31
Automatic Water Feeders.....	50

B

Backs for Sinks.....	83
Back, Water, Couplings.....	67
Back Pressure Valves, I. B.....	25
Balance Disc Governor Valves.....	26
Balls, Copper.....	70
Bands.....	71
Bands, with Outlets.....	78
Barnes' Pipe Cutters.....	98
Barnes' Wrench.....	97
Barrows.....	106
Bartholomew Water Closet.....	70
Basin Cocks.....	67
Basin, Wash, Iron.....	86
Bath Tubs.....	71
Bath Cocks.....	61
Bath Cocks, Double.....	67
Bath Plugs.....	68
Baxter's S. Wrench.....	98
Belting, Leather.....	110
Bench Vises.....	93, 95
Bends, Brass.....	34
Bends for C. I. Pipe.....	72, 73
Bends, Coil.....	49
Bends, Quarter.....	16
Bends, Return.....	13
Benton's Lubricators.....	42
Bibb Cocks, Ground Work.....	63
Bibb Cocks, Compression.....	65
Bibb Ends, Hose.....	67
Bibbs, Steam.....	35
Blake's Hangers.....	17, 109
Blocks, Pulley.....	105

	PAGE
Blowers.....	106, 131
Blow Pipes.....	101
Blunt's Universal Force Pumps.....	57
Boilers, Copper and Iron, for Ranges.....	71
Boilers, Nason's, Steam.....	112, 113
Boilers, Nason's, Hot Water.....	114
Boiler Feed Pump.....	135
Boiler Pump and Base.....	136, 138
Boiler Tubes.....	5
Boiler Couplings.....	67
Boiler Stands.....	88
Boiler Ratchet.....	99
Boiler Tube Expander.....	100
Bolts.....	102, 104
Bolts, Expansion.....	102, 103
Bolts for Sinks.....	84
Bolt Threading Attachment.....	90
Bowls, Closet.....	87
Boxes for Street Washer.....	85
Box Coils.....	48
Bracket Cocks.....	53
Brackets, Gas Fixture.....	56
Brackets, Foot Rail.....	146, 147
Branches.....	13
Branches, Tee.....	74, 75
Branch Tees.....	15
Brass Fittings.....	34
Brass Gas Fixture Fittings.....	53
Brass Pipe.....	34
Breckenridge Air Valves.....	31
Brock's Chain Tongs.....	97
Brown's Tongs.....	96
Brushes, Flue.....	108
Burners.....	55
Burner Cocks.....	53
Burner Pliers.....	99
Bushings.....	13, 16
Bushings, Brass.....	34

C

Caps, Cast Iron.....	13
Caps, Brass.....	34
Caps, Malleable Iron.....	21
Caps, Ventilating.....	81, 86
Caps, with Hubs.....	81
Cast Iron Fittings.....	12, 17
Cast Iron Flanges.....	14
Cast Iron Pipe, Drain.....	9, 72
Cast Iron Pipe, Heavy Flanged.....	10
Cast Iron Pipe Connections.....	72, 85
Cast Iron Sinks.....	82, 83
Cast Iron Traps.....	78, 80
Ceiling Plates.....	17
Centrifugal Fans.....	131

	PAGE
Cess Pools.....	84
Cess Pool with Bell Trap.....	84
Cess Pool with Bell Trap and Grating.....	85
Cess Pool Plates, Round.....	85
Cess Pool Plates, with Bars.....	85
Cess Pool Plates, with Holes.....	85
Chain Stays.....	67
Chain Tongs.....	96, 97
Chandeliers.....	56
Chandelier Hooks.....	22, 55
Chapman's Gate Valves.....	41
Check Valves, I. B.....	25
Check Valves, Brass.....	26
Check Valves, Swinging.....	36
Chime Steam Whistles.....	32, 33
Chisels.....	105
Christoffel's Scraper.....	108
Circular Radiator.....	126
Cisterns	69
Cistern Pumps.....	58
Closet, Bartholomew.....	70
Closet Bowl.....	87
Coal Barrow.....	106
Cocks, Air, Cylinder and Gauge	27
Cocks for Steam Gauges.....	29
Cocks, Gauge, Regester's Ball.....	44
Cocks, Radiator, Air.....	30
Cocks, Union Meter.....	28
Cocks, Service.....	28
Cocks, Steam, Brass.....	26
Cocks, Iron.....	23
Cock Wrenches.....	17, 22
Cocks for Gas Fixtures.....	53, 55
Cocks for Water.....	61, 66
Code, Telegraphic.....	4
Coes' Wrenches.....	97
Coils, Box or Return Bend.....	48
Coil Screens.....	48
Coil, Heater.....	49, 50
Coil, Wall.....	49
Coil, Spiral.....	50
Coil Stands.....	15
Column Radiators.....	127
Column, Water.....	29
Compression Brass Work	65
Combination Stock with Dies	91
Combination Vise.....	93
Combined Boiler, Pump and Base.....	136, 138
Connections.....	12, 17
Connolly Street Washer and Stop Cocks.....	69
Conrow's Exhaust Condenser.....	105
Condensers, Steam Traps, Nason's.....	132
Copper Balls.....	70
Copper Pots	134
Copper Range Boilers	71
Copper Bath Tubs.....	71
Corner Fittings.....	146
Corner Wrenches.....	86
Corner Sinks	82
Corporation Stops.....	63
Cotton Hose	110
Couplings.....	21, 22
Couplings, Brass.....	34
Couplings for Range Boilers.....	67
Couplings for Water Backs.....	67
Couplings for Valves.....	68

	PAGE
Couplings for Hose.....	69
Couplings for Sinks.....	83
Covers.....	81
Crosses, Cast Iron.....	13
Crosses, Malleable Iron.....	20
Cross Valves, I. B.....	25
Cross Valves, Brass.....	26
Crosses, Brass.....	34
Crosby's Steam Gauges.....	45
Cross Head Branches.....	75
Crow.....	99
Cups, Oil.....	31
Cups, Engine.....	44
Cutting Machines for Pipe.....	91, 93
Cutting Tools, Pipe Threads	91, 93
Cutters, Pipe.....	98
Cupola Blowers.....	106
Cylinders, Drip Well.....	60
Cylinder Cocks.....	27

D

Damper Regulators.....	52, 115, 116
Dart's Pipe and Bench Vise.....	93
Davis Air Valves.....	31
Deep Well Pumps	58
Die Holder.....	91
Dies.....	91
Differential Pulley Blocks.....	105
Dimension Wrought Iron Pipe.....	6
Discharge Cistern.....	69
Double Acting Force Pumps.....	59
Double Bath Cocks.....	67
Double Hubs	76
Double Half Y Branches.....	75
Double Steam Kettles	51
Double Tee Y Branches.....	75
Double Y Branches.....	75
Draft Regulators.....	52, 115, 116
Dreyfus' Patent Oilers.....	43
Drills.....	96
Drilling Crow.....	99
Drill, Ratchet.....	99
Drive Well Pipe.....	6
Drive Well Points.....	60
Drop Fittings.....	20
Drop Lights.....	56
Du Bois Feed Traps.....	70
Dudgeon's Jacks.....	109
Dudgeon's Tube Expanders.....	100

E

Eddy Gate Valves.....	40
Eighth Bends.....	73
Eighth Bends, Double Hub.....	73
Ejectors, Nason's.....	45
Elevator Valves.....	28, 144
Elbows	13, 18
Elbows, Brass.....	34
Elbow Cocks for Gas Fixtures.....	53
Ends, Hose Bibb.....	67
End Pieces.....	146
Engineers' Oiler Sets.....	107
Engineers' Hammers.....	104

	PAGE
Engine Cups	44
English Hoppers.....	87
Exhaust Condensers.....	105
Expanders, Tube.....	100
Expansion Bolts.....	102, 103
Expansion Joints, I. B.....	23
Expansion Joints, Brass.....	26
Expansion Plates.....	17
Extension Pieces.....	21

F

Fans	131
Feeder, Automatic Water.....	50, 143
Feed Pumps.....	135
Feed Water Heaters.....	49
Felting, Hair.....	108
Ferrules.....	77
Fittings, Cast Iron.....	12, 17
Fittings, Brass.....	34
Fittings for Rail.....	146
Fittings for Spiral Pipe.....	9
Fittings, Gas Fixture.....	53
Fittings, Malleable Iron.....	18, 22
Fittings, Ammonia	148
Fixture Fittings for Gas.....	53
Fixture, Gas, Brackets.....	56
Flanged Cast Iron Pipe	10
Flanged Unions.....	13
Flanges	14
Floor Plates.....	17
Flue Brushes and Scrapers.....	108
Force, Plumbers' Pump.....	101
Force Pumps	57, 59
Forge Blowers	106
Forges, Portable	105
Foot Rail Brackets, &c.....	146
French Hoppers.....	87

G

Galvanized Fittings.....	13
Galvanized Iron Pots	134
Garden Hose.....	110
Gas Fitters' Proving Pump.....	100
Gas Fitters' Augers	100
Gas Pipe Hooks.....	17, 55
Gas Service Cocks	28
Gas Fixture Fittings	53
Gas Fixture Brackets	56
Gas Pliers	99
Gate Valves.....	36, 41
Gauge, Ammonia	148
Gauge Cocks	27
Gauge, Water	29
Gauges	45
Gauge Cocks, Regester's.....	44
Gauge, Steam Cock	29
Gleason's Stock for Brass Pipe.....	93
Globe Valves, I. B.....	25
Globe Valves, Brass	26
Glue Heaters, Nason's.....	134
Governor, Balance Disc Valves.....	26
Governor, Pickering's.....	44
Grates for Side Walks	85
Guide	91

H

	PAGE
Half Y's.....	77
Half S Traps.....	79
Half Round Sinks.....	82
Half Y Branches.....	74
Half Y Branches, Double.....	75
Hair Felting	108
Hammers	104
Hancock Inspirators	47
Hand-Hole T's.....	76
Hand Cutting Machines	89
Hand Chisels	105
Handy Lubricators	42
Hangers	17
Hangers, Blake's	109
Haydenville Gate Valves	36
Heater Coils	50
Heaters, Feed Water	49
Heaters, Glue, Nason's	134
Hinge Vise	94
Holder, Die	91
Hooks, Chandelier	22, 55
Hooks for Cast Iron Pipe	81
Hook Plates	15
Hooks, Pipe	17, 55
Hoppers	87, 88
Hopper Cocks	65
Hose Bibbs, Compression	65
Hose Bibbs Ends	67
Hose Couplings	69
Hose Bibbs, Ground-Work	63
Hose	110
Hose Nipples	69
Hose Pipes	68
Hose Sprinklers	68
Hubs, Double	76
Hubs, Single	76
Hubs, Saddle	77
Hydraulic Jacks	109
Hydrant Cess Pools	84
Hydraulic Pipe	7
Hydraulic Rams	59
Hydrants	60
Hydrant Cocks	63

I

Improved Hoppers	87
Increases	78
Independent Gas Cocks	55
Indirect Radiators	128, 129
Injectors, Korting's	47
Injectors, Rue's Little Giant	47
Inspirators, Hancock's	47
Iron Coils	23
Iron Fittings, Cast Iron, &c	12, 17
Iron Fittings, Malleable	18, 22
Iron Flanges	14
Iron Pipe	5, 6, 7
Iron Pots for Glue	134
Iron Range Boilers	71
Irons, Roof	81
Iron Sink Traps	84
Iron Tanks	88
Iron Traps	78, 80
I X L Cutting and Threading Machines	128, 129

J

PAGE

Jacketed Steam Kettles.....	51
Jacks, Hydraulic.....	109
Jarecki's Die Stock.....	92
Jarecki's Tongs.....	96
Jenkins' Patent Valves.....	38
Jenkins' Gate Valves.....	38
Joints, Brass.....	26
Joints, I. B.....	23
Joints, Steam Swing.....	35

K

Kennedy Gate Valves.....	39
Kettles, Steam.....	51
Key Wrench.....	98
Kitchen Sinks.....	83
Korting's Injectors.....	47

L

Lamp Cocks.....	54
Lamps.....	106
Lap Welded Boiler Tubes.....	5
Laterals	13
Lead Pipe.....	11
Lead Traps, Du Bois.....	70
Leader Pipe	8, 81
Leather Belting.....	110
Legs for Sinks.....	83
Lift Pumps, Single Acting.....	70
Linen Hose	110
Little Giant Injector, Rue's.....	47
Locknuts.....	13, 22
Locknuts, Brass	34
Long Bends for Cast Iron Pipe.....	72
Long Hoppers.....	88
Long Screws.....	16
Long Stop Cock Boxes.....	86
Long Tee Branches.....	74
Low Pressure Safety Valves, I. B.....	25
Lubricators, Common.....	31
Lubricators, Benton's.....	42
Lubricators, "Handy"	42
Lubricators, Nathan's.....	43
Ludlow Gate Valves.....	37

M

Machinists' Hammers	104
Machines for Cutting and Threading Pipe.....	89
Machine Bolts.....	104
Malleable Bushings.....	16
Malleable Unions.....	16
Malleable Iron Fittings.....	18, 22
Malleable Iron Stocks.....	91
Malleable Pipe Vise, Light.....	93
Malleable Lamps.....	106
Malleable Oiler	106
Manifolds.....	15
Manifold Coils.....	49
Marble Tops	48
Meter Cocks, Union	28
Meter, Water, Worthington's.....	142
Middle Swings.....	54

Monkey Wrench	97
Morris' Ratchet Wrench.....	98
Mushroom Strainers.....	23

N

Nason's Ejectors or Syphon Pumps.....	46
" Open Jaw Pipe Vise.....	93, 145
" Steam Boilers.....	112, 113
" Hot Water Boiler.....	114
" Damper or Draft Regulator.....	115
" Regulator, Safety Attachment.....	116
" Radiators	117, 131
" Improved Radiator.....	118, 119
" Box Base "	120
" Duplex "	121
" Standard "	222, 127
" Circular "	126
" Column "	127
" Fans.....	131
" Steam Traps.....	132, 133
" Glue Heaters.....	134
" Boiler Feed Pumps.....	135
" Boiler, Pump and Base.....	136
" Water Feeder.....	143
" Elevator Valves, Q. O.....	144
" Foot Rail Brackets and Fittings.....	146, 147
" Ammonia Valves and Fittings.....	148, 150

Nathan's Lubricators	43
National Tube Scraper.....	108
Nipples	16
Nipples, Brass	34
Nipples, Soldering.....	28
Nozzles, Hose.....	69
Nozzles, Side.....	55
Nozzles, Straight.....	55
Nut Tapping Attachment.....	90

O

Offsets.....	13, 76
Oil Cups.....	31
Oilers, Dreyfus' Patent.....	43
Oilers, Malleable.....	106
Oiler Sets.....	107
Oil Pumps.....	107
One-eighth Bends.....	73
One-fifth Bends.....	72
One-sixth Bends.....	73
One-sixteenth Bends.....	73
One-quarter Bends.....	72
Open Jaw Pipe Vise.....	93, 145
Ornamental Screens for Coils.....	48
Oval Closet Bowls.....	87

P

Packings	111
Parker's Bench Vises.....	95
Peet Gate Valves.....	37
Pendant Cocks.....	53
Pendants	56
Philadelphia Hoppers.....	87
Pickering Governors.....	44
Pillar Cocks.....	54

	PAGE
Pillars.....	55
Pipe, Cast Iron Drain.....	72
Pipe Cutting and Threading Machines.....	89
Pipe Dies.....	91
Pipe Hangers.....	17
Pipes, Hose.....	68
Pipe Hooks.....	17
Pipe Hooks for Cast Iron Pipe.....	81
Pipe Rests.....	81
Pipe Stoppers.....	77
Pipe, Wrought Iron.....	5 to 11
Pipes, Leader.....	81
Pipe Taps.....	96
Pipe Cutters.....	98
Pipe Reamers.....	96
Pipe Tongs.....	96
Pipe Vises.....	93, 95, 145
Pipe—Brass.....	34
Pitcher Spout Pumps.....	58
Plain Iron Fittings.....	12, 17
Plain Bibbs.....	63, 65
Plain Stops.....	61
Pliers, Gas Pipe.....	99
Plates, Ceiling and Floor.....	17
Plates, Hook, Expansion and Ring.....	15
Plates for Cess Pools, Round.....	85
Plates for Cess Pools, with Bars.....	85
Plates for Cess Pools, with Holes.....	85
Plates, Screwing and Dies.....	91
Plugs, Cast Iron.....	13
Plugs for Sink, Bath or Wash Tray.....	68
Plugs, Brass.....	34
Plugs Malleable Iron.....	21
Plug Sink Strainers.....	83
Plumbers' Brass Work.....	61, 68
Plumbers' Force Pumps.....	101
Plumbers' Proving Pump.....	101
Plumbers' Torch.....	101
Points, Drive Well.....	60
Pools, Hydrant Cess.....	84
Pools, Cess, with Bell Traps.....	84
Pools, Cess, with Bell Traps and Grating.....	85
Pop Safety Valves.....	107
Portable Forge.....	105
Pots for Glue Heater.....	134
Pressure Pipe.....	8, 10
Pressure Regulator.....	52
Pulley Blocks.....	105
Pumps, Nason's Syphon.....	46
Pumps, Force Cistern and Spout.....	57, 59
Pumps, Cylinder.....	60
Pumps, Single Acting, Lift.....	70
Pumps, Gas Fitters', Proving.....	100
Pumps, Oil.....	107
Pumps, Boiler Feed.....	135
Pumps, Boiler and Base.....	136, 138
Pumps, Steam, Worthington's.....	139, 141

Q

Quarter Bends for Cast Iron Pipe.....	72
Quarter Bends for Wrought Iron Pipe.....	72
Quarter Bends, Double Hub.....	73
Quarter Bends with connections.....	78
Quick Opening Elevator Valves.....	28, 144

R

	PAGE
Radiators.....	117, 131
Radiators, Improved Pattern.....	118, 119
Radiators, Box Base.....	120
Radiators, Duplex Pattern.....	121
Radiators, Standard.....	122, 127
Radiator Screens.....	130
Radiator Air Cocks.....	30
Radiator Air Valves.....	31
Radiator Valves.....	30
Rail Brackets.....	146, 147
Rams.....	59
Ratchet Drill.....	99
Ratchet, Packers' Boiler.....	99
Ratchet Wrench.....	98
Reamers.....	96
Reducers for Cast Iron Pipe.....	76
Reducing Couplings, Cast Iron.....	13
Reducing Couplings, Malleable.....	21
Regester's Ball Gauge Cock.....	44
Regulators, Draft or Damper.....	52, 115, 116
Regulating Valves, Elevator.....	28, 144
Rests, Pipe.....	81
Return Bends.....	13
Return Bends, Brass.....	34
Return Bend Coils.....	48, 49
Return Bends for Cast Iron Pipe.....	73
Revolving Cocks.....	54
Ring Plates.....	15
Riveted Pipe.....	8, 9
Robbins' Chain Tongs.....	96
Roof Irons.....	81
Rosette.....	146
Round Cess Pool Plates.....	85
Rough Stops.....	66
Rouse Pipe, Nut and Bolt Wrench.....	97
Rubber Hose.....	110
Rubber Washers.....	107
Rue's Little Giant Injector.....	47
Running Traps.....	80
Running Traps with Vents.....	80
Running Traps with 4 inch Outlets.....	80

S

Saddle Hubs.....	77
Saddle Y's.....	77
Safety Valves, I. B.....	25
Safety Valves, Low Pressure.....	25
Safety Valves, Brass.....	26
Safety Valves, Pop.....	107
Saunders' Pipe Cutters.....	98
Scotch Gauge Glasses.....	107
Scrapers, Flue.....	108
Screws, Long.....	16
Screens for Radiators.....	130
Screens for Coils.....	48
Screwing Plates with Dies.....	91
Short Hoppers.....	87
Short Hoppers with Trap.....	88
Shower Bath Cocks.....	61
Side Nozzles.....	55
Side Walk Grates.....	85
Single Acting Lift Pumps.....	70
Single Hubs.....	76
Sinks.....	82, 83

	PAGE
Sinks, Slop.....	82
Sink Legs.....	83
Sink Backs.....	83
Sink Plugs.....	68
Sink Couplings.....	83
Sink Bolts.....	84
Sink Strainers.....	83
Sink Traps.....	84
Sleeves.....	76
Sliding Stop Valves.....	36, 41
Smith's Combination Vise.....	93
Sockets, Reducing.....	13
Soldering Nipples.....	28
Soldering Unions.....	28
Solid Dies.....	91
Spencer's Brushes.....	108
Spiral Coils.....	50
Spiral Pipe.....	9
Spiral Pipe Fittings.....	9
Spout, Pitcher Pumps.....	58
Sprinklers, Hose.....	68
Square Sinks.....	82
Stands for Coils.....	15
Stands for Range Boilers.....	88
Stanwood's Pipe Cutter.....	98
Stays, Chain.....	67
Steam Bibbs and Stops.....	35
Steam Cocks.....	28
Steam Cocks, Brass.....	26
Steam Gauge Cocks.....	29
Steam Gauges.....	45
Steam Kettles.....	50
Steam Dampers or Regulators.....	52
Steam and Gas Fitters' Tools.....	89
Steam Heaters for Glue.....	134
Steam Hose.....	110
Steam Pumps, Worthington's.....	139, 142
Steam Traps, Nason's.....	132, 133
Steam Swing Joints.....	35
Steam Whistles.....	32
Steel Flue Brushes.....	108
Stillson's Wrench.....	97
Stocks and Dies.....	91, 93
Stocks, Malleable Iron with Dies.....	91
Stop Cocks, Iron.....	23
Stop Cock Boxes, Long.....	86
Stops.....	61, 66
Stops, Steam.....	35
Stop and Street Washer Boxes.....	85
Stoppers, Pipe.....	77
Straight Cocks.....	53
Straight Wash Tray Bibbs.....	65
Straightway Valves.....	36, 41
Straight Nozzles.....	55
Strainers.....	23
Strainer, Ammonia.....	150
Straps.....	22
Street Lamp Cocks.....	54
Street Washers.....	60
Street Washers and Stop Cocks, Connolly's.....	69
Swings, Top.....	54
Swings, Middle.....	54
Swings, Universal.....	54
Swing Joints.....	35
Swinging Check Valves.....	36
Swivel Vise for Pipe.....	94

	PAGE
Swivel Vise for Bench.....	94
S. Wrench.....	98
Syphon Pumps, Nason's.....	46
S 1/2, S 3/4, Full S Traps.....	78, 80

T

Tanks, Iron.....	88
Taps, Pipe.....	96
Tapping Crow.....	99
Tarring, Prices for.....	78
Tees.....	13, 18
Tees, Branch.....	15
Tees, Brass.....	34
Tee Branches.....	74
Tees, Hand-Hole	76
Tee Y Branches	74
Telegraphic Code.....	4
Thimbles.....	77
Thimbles with Covers.....	77
Threading, Pipe, Machines.....	89
Threading and Tapping Attachment.....	90
Three Way Cocks, Brass.....	26
Tips.....	55
Tongs, Pipe.....	96, 97
Tongs, Patent Pipe.....	96, 97
Tops, Marble.....	48
Top Swings	54
Torch, Plumber's.....	100
Trap Covers.....	81
Trap for Sinks.....	84
Trap, Exhaust.....	105
Trap, Steam, Nason's.....	132, 133
Traps, Cast Iron.....	78, 80
Traps, Lead, Du Bois	70
Traps, S, 1/2 S and 3/4 S	78, 80
Traps with 4 inch Vent.....	79
Tray Bibbs, Ground Work.....	63
Tray Bibbs, Compression.....	65
Tray Plugs.....	68
Tubes, Boiler.....	5
Tube Expander.....	100
Tube Brushes and Scrapers.....	108
Tubs, Bath, Copper.....	71
Turnbuckles.....	101

U

Unions, flanged.....	13
Unions, Malleable Iron.....	16
Union Meter Cocks.....	28
Union, Soldering.....	28
Union, Brass.....	34
Universal Swings.....	54
Universal Force Pumps	57
Urinals.....	86

V

Valves, Automatic Air.....	31
Valves, Brass.....	26
Valves, Chapman's	41
Valve Couplings.....	68
Valve Closet.....	70
Valves, Elevator, Q. O.....	28, 144
Valves, Eddy's, Gate	40

	PAGE
Valves, Foot.....	23
Valves, Gate.....	36, 41
Valves, Haydenville.....	36
Valves, Iron Body, Brass Mounted.....	24, 25
Valves, Jenkins' Patent.....	38
Valves, Jenkins' Gate.....	38
Valves, Kennedy's.....	39
Valves, Ludlow.....	37
Valves, Peet's.....	37
Valves, Pop, Safety.....	107
Valves, Radiator.....	30
Valves, Straightway.....	36, 41
Valves, Swinging Check.....	36
Valves, Whistle.....	33
Valves, &c., Ammonia.....	148
Ventilating Caps.....	81, 86
Ventilating Y's.....	74
Vertical Tube Radiators.....	117, 131
Vises.....	93, 95, 145
Vise, Crow for Drilling and Tapping.....	99

W

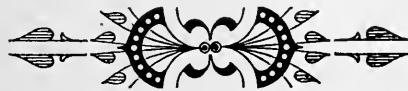
Wall Coils.....	49
Washer, Street, Boxes.....	85
Wash Basins, Iron.....	86
Washers for Gauge Glasses.....	107
Wash Tray Plugs.....	68
Wash Tray Bibbs, Ground Work.....	63
Wash Tray Bibbs, Compression.....	65
Washer, Street.....	60
Wastenuts.....	22

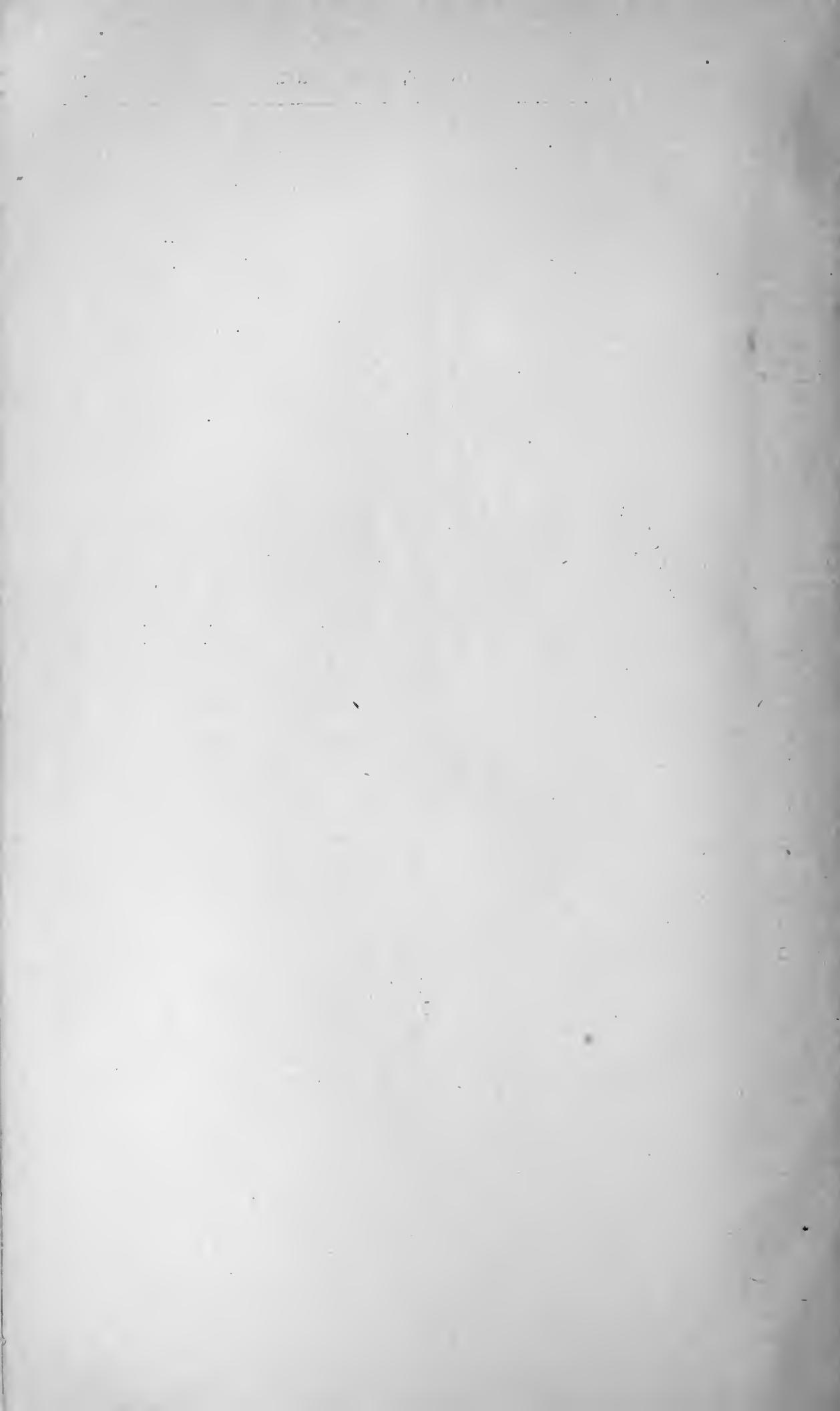
	PAGE
Water Columns.....	29
Water Feeder, Automatic.....	50, 143
Water Gauges.....	29
Water Heater for Feed Water.....	49
Water Back Couplings.....	67
Water Meters, Worthington's.....	142
Well Pipe.....	7
Well Pumps.....	58
Well Points.....	60
Weston's Pulley Blocks.....	105
Whalebone Flue Brush.....	108
Whistles.....	32, 33
Whistle, Chime.....	33
Whistle Valves.....	33
Worthington's Pump and Boiler Combined.....	136, 138
Worthington's Steam Pumps.....	139, 141
Worthington's Water Meter.....	142
Wrenches.....	17, 22, 97, 99
Wrought Iron Key Wrench.....	98
Wrought Iron Bends.....	16
Wrought Iron Fittings.....	16
Wrought Iron Pipe.....	5, 6, 7
Wrought Iron Tube Radiators.....	117, 131

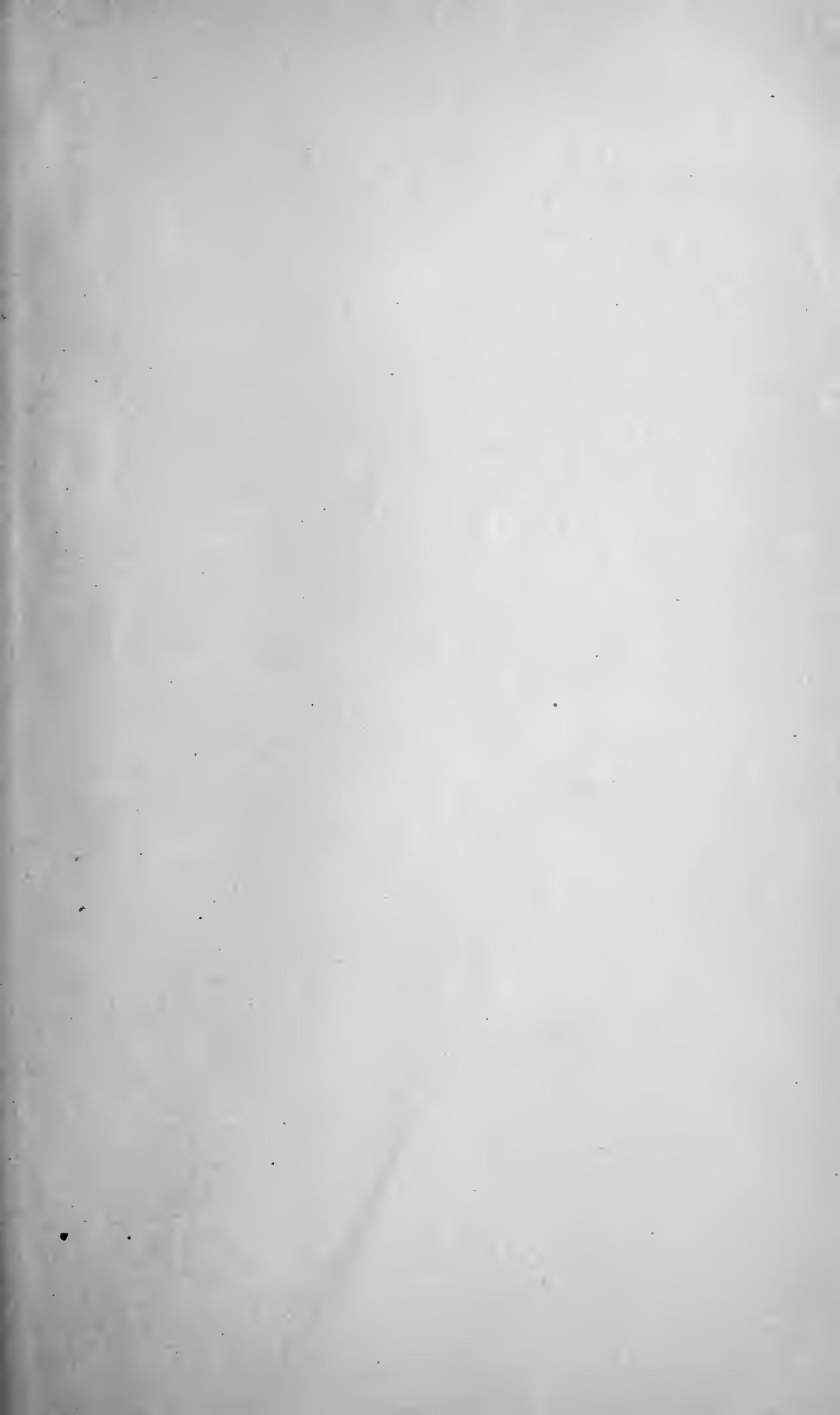
Y

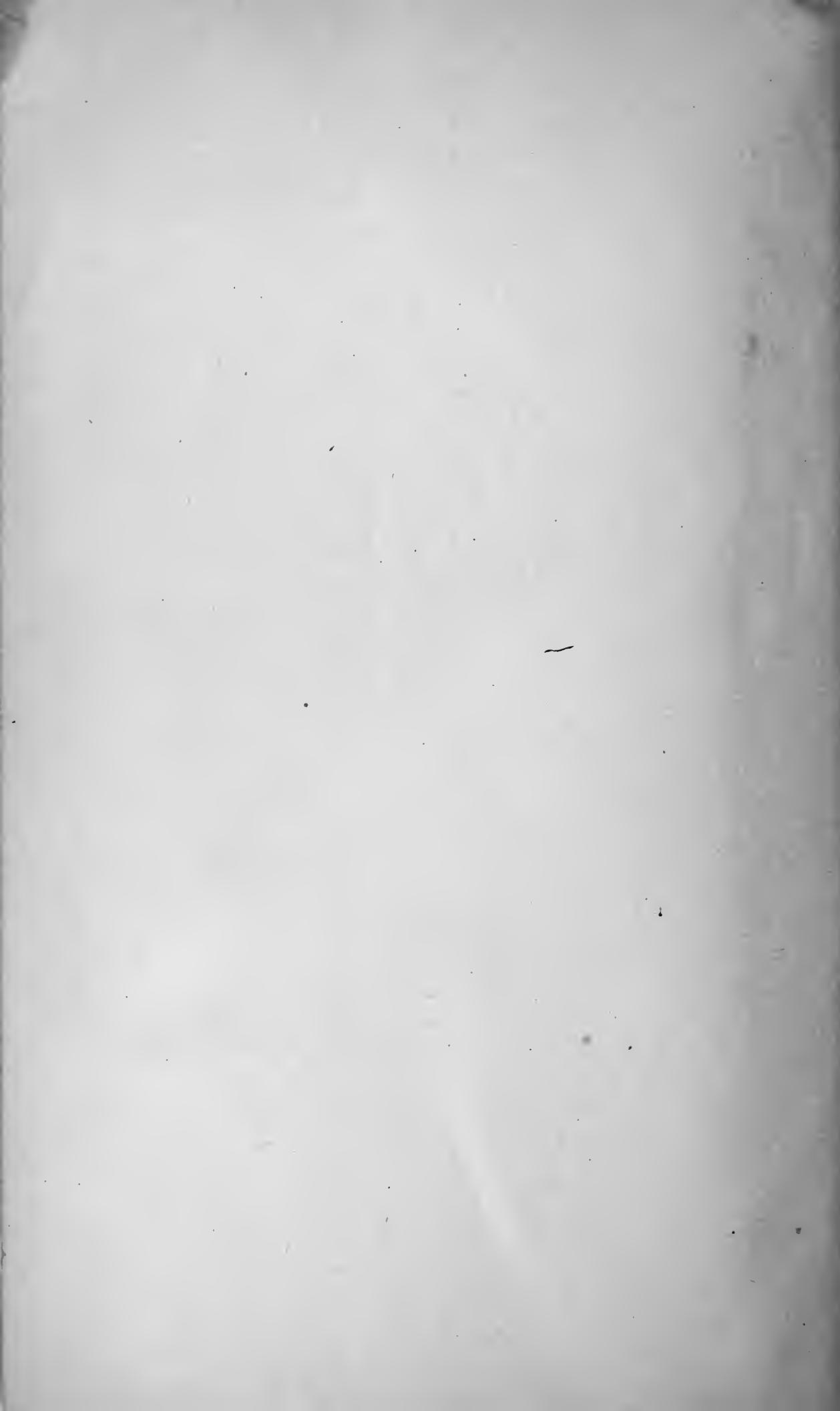
Y Branches.....	74
Y Branches, Ventilating.....	74
Y Branches, Double.....	75
Y's Saddle.....	77
Y's Half.....	77

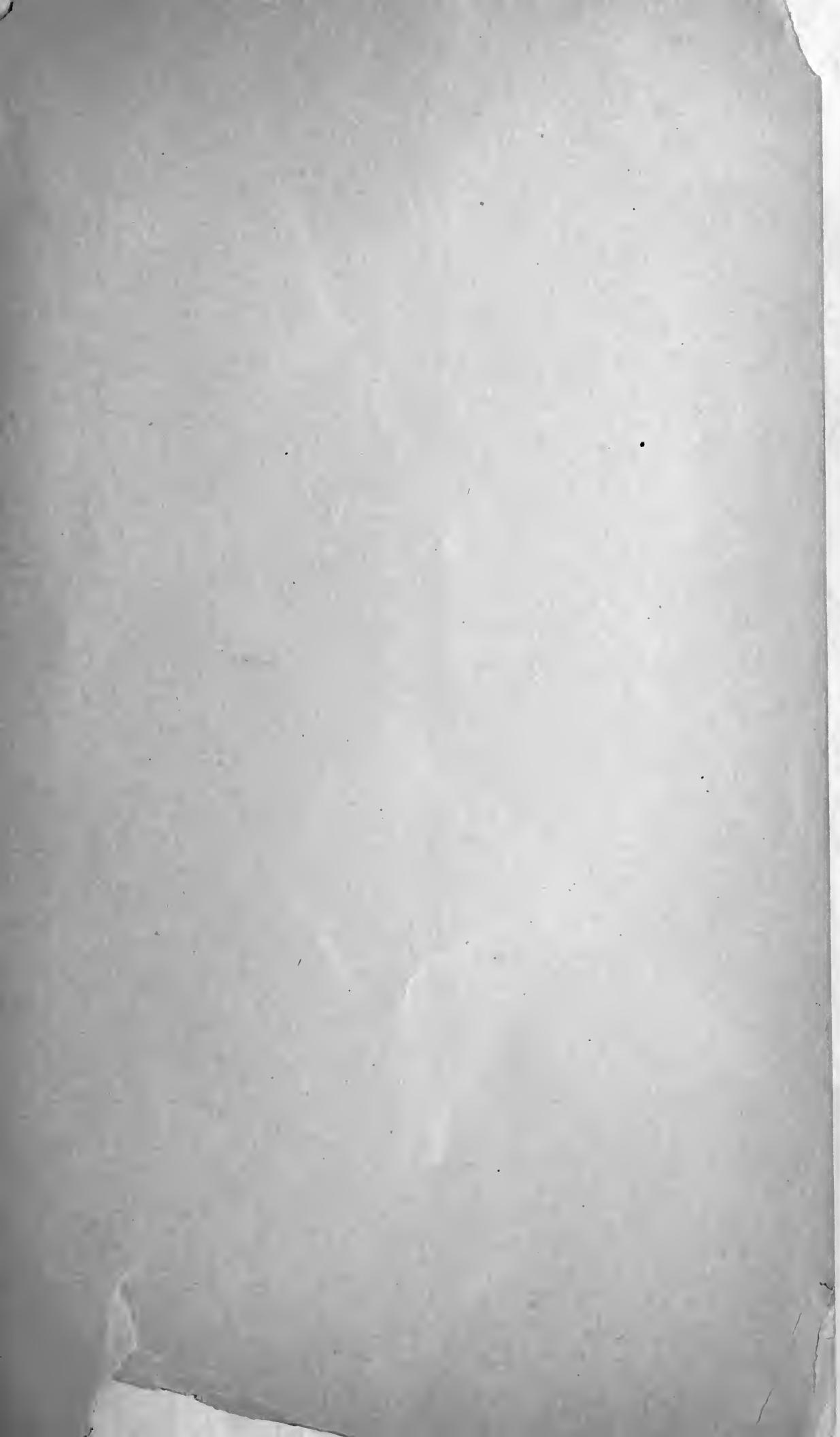
NOTE.—Useful information and valuable Tables for ready reference, pages 151 to 171.











LIBRARY OF CONGRESS



0 021 213 046 1